

Guessing Right and Wrong: Intra-Party Bargaining and Electoral Uncertainty

A game-theoretical study of policy-motivated factions and voters in a two-party democracy with a laboratory experiment

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Abstract.

How do political parties work on the inside? Which factors determine their policies? What is the place of the electorate in the functioning of parties? In the past two decades, the search for the answers to these questions have spurred a number of important contributions to the game theoretical literature on political parties that examined party politics either at the level of individual politicians and voters, or as a process involving factions - the intra-party groups of like-minded party members. This thesis attempts to expose the internal policy-setting mechanism of political parties by reconciling the logic of the two approaches. A formal model is introduced to describe how the two factions of a governing party decide on its official policy point in a one-dimensional policy space, and how their choice is assessed by the individual voters, whose policy preferences coincide with those of either of the factions. The theoretical predictions derived from the analysis of the model are evaluated with a laboratory experiment. The findings from the statistical evaluation of the experimental results confirm that the policy change that leads to the re-election of the party occurs in a fragile equilibrium characterised by a positive policy distance difference between the ideal points of the factions and voters, who see the electoral uncertainty as less important than the policy motivation. A negative policy distance difference tends to result in the re-election of the incumbent party on its current policy preserved by the factions. Still, the greater presence of imperfect information significantly increases incentives for a policy change and induces voter defection to the opposition if the current policy is retained, as shown by the theory and the experimental analysis. In general, this study places voters at the heart of intra-party policy-setting while benefitting our understanding of the collective aspect of factional bargaining and shedding a new light on the electoral success and policy stability of political parties.

Keywords: political parties, party factions, voting behaviour, imperfect information, sequential game, laboratory experiment.

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“I think politics is a team sport, and we came together as a team. I think we’ve got to be united as a party. Divided parties don’t win elections.”

- Sadiq Khan, the Mayor of London

Asthana, Anushka and Heather Stewart. “Sadiq Khan calls on Corbyn to 'get Labour back in the habit of winning elections'”. *The Guardian (UK)*, May 13, 2016.

Introduction.

Different opinions and political positions can exist inside any political party. Disagreements are found within even the tiniest groups of people: household members constantly fight over mundane issue such as which sort of bread to buy for supper; tenants' committee members argue about what share of the budget to allocate for ordering snacks and drinks for everybody to enjoy at the movie night organised at the common room; coworkers quarrel over the question of whose turn is it to load the dishwasher with dirty coffee mugs this Wednesday. Political parties normally attract large enough groups of supporters who join their ranks for a variety of reasons, ideological and sometimes purely material. Naturally, such a complex and large collective formation as a political party can also be affected by the problems of a similar kind.

This intuition has clearly been taking root in the literature on political parties: the recent scholarship has been increasingly keen on embracing the notion of a political party as a heterogenous collective entity as a starting point for developing theories of party system change and coalition formation (Giannetti and Benoit 2008; Mershon and Shvetsova 2013). However, only a limited number of authors have examined the collective dynamics of intra-party bargaining (Boucek 2009; Ceron 2012). If the party operates in the institutional environment of intra-party democracy, it is reasonable to expect that disagreements are unlikely to be suppressed with the iron fist of a dictatorial leader. Hence, every party member's desire should be not only to resolve the conflict by setting the official party policy that gives the party the best shot at achieving electoral success, but also for their own preferred policy to be the one that is acknowledged as the common party policy by all of the party's members. In a party founded on the principle of internal democracy one member's interest is unlikely to have a significant influence on the totality of the party's organisation - unless it is supported by a sufficiently numerous contingent of like-minded members, which in this thesis I refer to as 'factions'. In this thesis, I argue that political parties, even those which are famous for their exceptional internal cohesion and strict party discipline, can at times fall prey to vicious internal infighting. Moreover, the likely instigators of conflict are precisely the internal factions of the party organised to promote such policy positions that are accepted by the totality of their members and are distinct from the position promoted by rival factions (Ceron 2012).

Just as the existing theories of factionalised parties have tended to set voters aside and focus solely on factions (Boucek 2012; Ceron 2012), the research on party system change and coalitions that understands parties as fragmented organisations has modelled intra-party politics through the lense of individual legislators and voters and not their collective coordination (Giannetti and Benoit 2008; Mershon and Shvetsova 2013; Schofield 2007). The analysis in this study combines the two approaches and refines their logic by showing that the establishment of factions and the ensuing factionalist struggle are not motivated solely by policy-related disagreements of the party members, and that factions are subjected to considerable pressure from the party's electorate. It is the voters who are selecting their preferred alternative to govern the country on the polling day, and they will certainly be casting their votes with the goal of helping the party whose policy tops their ranking of alternatives into government. A policy that fails to provoke the sympathy of the majority of voters is unlikely to bring victory to the party, and the decision-making attitudes of factions must be affected by this consideration. Electoral defeat is the obvious negative externality that damages a party that promotes unpopular policies and is bound to deprive its factions of the opportunity to influence governmental policy-making. Conversely, the factions may cooperate to choose the correct official policy that should help their party win over the hearts of the masses and keep them at the helm of the power (Boucek 2009) - a positive externality of factionalism that is less likely to appear in authoritarian parties that restrict internal discussions and disregard the wishes of the public. My thesis is an attempt to demonstrate how and in what circumstances the internal policy decisions are made and why party members can either end up lamenting their party's ill fate or find themselves dancing gleefully to the upbeat music at an election night celebration party, surrounded by bundles of brightly coloured balloons.

The problem of factionalism. Political parties respond to factionalist conflict in a variety of ways. Sometimes factions break away from their parent party which they believe can no longer be influenced from inside and should be challenged externally. This emerged as the strategy chosen by some of the members of the Hellenic Parliament for the Coalition of the Radical Left (SYRIZA) in the aftermath of the Greek bailout agreement negotiations and the ensuing referendum. The leader of the newly founded party, Panagiotis Lafazanis, announced the creation of Popular Unity by stating that

A new power is coming to the fore. We aim for government ... and we will not fall victim to blackmail. We want to become a great movement that will sweep the bailouts aside. (Henley and Traynor 2015).

It became clear shortly afterwards that the core reason that led him to declare to be behind the move to break away from SYRIZA was the irresolvable policy-related disagreement between the wing of the party affiliated with Lafazanis and the its leader, Alexis Tsipras, concerning the principal approach to dealing with the country's economic woes. Severing ties with the parent party and founding a new one can turn out to be a risky decision and lead the disgruntled rebels to lose even the minor influence on policy making they possessed before - which is exactly the outcome faced by Lafazanis and his breakaway party in the aftermath of the 2015 Greek legislative election (Nardelli 2015).

It is desirable that a turbulent 'exit' (a term used by Albert Hirschman in his seminal study of the collective action problems in organisations, "Exit, voice and loyalty" (1970), to describe the last-resort strategic response of the disaffected and powerless members to punish the organisation by resigning from it) of the indignant faction members is prevented before it occurs. Party cohesion, the ability of the party's members to contribute to its stated goals in a unified and coordinated fashion, is crucial to the very survival of the party, as a cohesive party's chances to persist in winning elections and maintain a working majority in the legislature are greater than that of a divided one (Bowler, Farrell and Katz, 1999). That is why parties often put mechanisms of internal conflict resolution in place. In the autumn of 2016 Pedro Sánchez, the then-general secretary of the Spanish Socialist Workers' Party (PSOE) attempted to reassert his and his supporters' crumbling position of dominance in the party and firmly commit the PSOE to voting against the reinstatement of the centre-right Popular Party government led by the Prime Minister, Mariano Rajoy. Sánchez intended to initiate and win an early leadership election by calling for a vote of his party's federal committee in order to formally approve this measure. He subsequently was forced to resign from his position after a heated standoff between his allies and opponents resulted in the victory of the rival faction. In this case, the party succeeded in quelling its divisive internal conflict through the existing procedures of internal party democracy: neither Sánchez, nor the members of his faction of the party resigned their membership of the PSOE - instead they, albeit begrudgingly, conceded defeat (Buck 2016). Interestingly, the internal strife of such magnitude that the PSOE has been experiencing lately differs enormously from its prolonged success in government in 1982-1997 and in the period from 2004 to 2011, during which the party's internal disagreements, often concerning the issue of dealing with demands for a greater degree of regional autonomy from the country's provincial governments, never resulted in high-profile destructive public tension and were tackled in a civic and cohesive manner (Heller 2002, 669; Hopkin 2009).

One of the darkest examples of potentially hurtful party infighting is perhaps the case of the Australian Labor Party (ALP) government, in office from 2007 to 2013. When the institutions such as the ones that the PSOE in Spain has developed are not perceived to be working sufficiently well, party members can agree to reform them. This is precisely what happened when the new majority coalition of members of the ALP reinstalled Kevin Rudd as the party leader in the summer of 2013. Rudd, wishing to stabilise the position of whoever holds the office of the party leader, pushed through a set of new party rules regulating the conduct of leadership elections. An election from then on could only be initiated with the approval of a qualified majority of the party's parliamentary caucus members, while the winning candidate would have to secure the majority of the combined and equally weighted vote of the caucus and rank-and-file party members. Previously, the rules allowed caucus members to call such a vote at a moment of their choosing - making first Rudd himself the victim of a sudden palace coup d'état in 2010 and then allowing him to return to power by deposing Julia Gillard in a similarly unexpected party room election in 2013 (Bourke 2015). "The Killing Season", a documentary on the events of the Rudd and Gillard years, has a quote by a former senior advisor to Tony Blair, Alan Milburn, which brings to light the utter disastrousness of the situation the party was in at the end of its term in government:

'The hard question that the Australian Labor Party has to ask itself is this: how is possible that you win an election in November 2007 on the scale that you do, with the goodwill that you have, with the permission that you're gifted by the public and you manage to lose all that goodwill, to trash the permission and to find yourself out of office within just six years? I've never seen anything quite like it in any country, anywhere, anytime, in any part of the world. No-one can escape blame for that, in my view' (Ferguson 2015).

In stark contrast to the drama of the leadership conflict in the ALP, the example of the changes in the immigration policy of the party during its six years in power underscores a high degree of internal cohesion. The policy shift in the ALP on the issue happened when the Kevin Rudd ministry adopted its 'stop the boats' policy, which imposed severe restrictions on foreign citizens coming by sea to seek asylum in Australia by making it virtually impossible for them to settle in the country, on July 19, 2013 as the official position of the party and the Australian government. Astonishingly, the concrete move to toughen the policy itself was touted by Julia Gillard as early as in 2010 when she ascended to the prime-ministership, but it apparently took the party a three-year internal discussion and a major

migration crisis to unanimously abandon a more lenient stance on immigration while maintaining internal peace with regard to policy-setting (Davidson 2016).

I selected these examples since they pertain to the realities of political life and are indicative of how complex the problem of intra-party conflicts is and representative of the broad array of means, by which parties tackle it. The main caveat is that these cases, however illustrative, do not provide a clear insight into the root causes of these drastic outcomes. They merely depict the alternative institutional designs and strategies that can be used to alleviate the symptoms of factionalist discontent in the most drastic and volatile circumstances, while largely overshadowing the policy-related debates during the longer periods of relative internal stability. It is thus very hard to describe exactly what happens inside a political party and how the outcomes of these processes are produced without examining the patterns of intra-party behaviour that allows the parties such as the ALP and the PSOE to consistently win elections and form governments. To answer the practical question of how a political party can escape implosion and nurture a high level of internal cohesion, emphasis should be placed on investigating the course of intra-party bargaining through the rigorous modelling of its features and expected results.

The aims of the study and the research questions. The purpose of the intended study is to explore and explain the relationship between intra-party decision-making process and voter response to it. The primary aims of the study are 1) to formulate a theoretical account of this relationship and 2) to evince theoretical as well as empirical predictions about its outcomes. The two pillars of this research project are the game theoretical model, which fuses the process of intra-party bargaining with the behaviour of voters with a goal of clarifying the links between the two and the implications of such, and the laboratory experiment that evaluates the predictions obtained from the model. The fundamental research question that this model aims to answer is given below:

1. Does a relationship exist between the intra-party policy-setting bargaining of factions and the response to such by the voters who supported the party at the previous election?

If such a relationship is indeed present, then two additional questions have to be addressed, namely:

2a. What is the structure and the primary mechanism of such a relationship?

2b. What are the key determinants of the outcomes of this relationship and how does their influence manifest itself?

The question *1* is answered by dissecting the problem at hand with the specifically designed theoretical instrument - a formal model. Simultaneously, the process of designing such an instrument produces a key to the question *2a* by interpreting the inner workings of the relationship being described with a focus on the policy preferences of the actors and the electoral uncertainty. Inferences regarding the question *2b* naturally follow from the findings that the model yields. The testable hypotheses are then formulated on the basis of the theory and subjected to an experimental evaluation. The completion of the analysis will make a significant contribution to the theory of political parties and the theory of voting behaviour and provide a valuable theoretical commentary to a number of phenomena affecting modern two-party democracies.

The roadmap of the study. I begin with Chapter 1 that sets the stage by offering a comprehensive review of the literature in political science that touches upon the theory behind intra-party bargaining, the concept of a faction, voting behaviour and the empirical evidence thereof. Chapter 2 takes on the essential methodological tools utilised in the course of this thesis. The game theoretical model of factionalism and voter response is introduced and discussed in detail in the Chapter 3. The findings from the laboratory experiment are scrutinised and interpreted in the Chapter 4. The thesis wraps up with the conclusion, where the implications of the theoretical and empirical results as well as the future of this research project are considered.

Chapter 1. The place of factionalism in the literature: political parties, factions and voters.

1.1. The intra-party politics in non-factional contexts.

Political parties have for a long time been the primary subject of study for several methodological and theoretical currents in political science (Aldrich 1995; Dalton and Wattenberg 2002; Duverger 1954; Downs 1957; Katz 2011; Key 1964; Kiewiet and McCubbins 1991; Mair 1997; Riker 1962; Schlesinger 1984; Schofield 2007), and intra-party politics has been featured as an auxiliary topic of varying prominence in the literature on political parties for several decades. Multiple studies of electoral competition and legislative politics exist, where the political party serves as the basic unit of analysis and is viewed as a unitary entity (Axelrod 1970; Laver and Schofield 1998; Powell 2000). However, as has been noted by many students of political parties in the course of the past several decades, this assumption profoundly disregards the part that intra-party phenomena play in shaping the agency of a party (Bowler, Farrell and Katz 1999; Druckman 1996; Giannetti and Benoit 2008; Laver and Shepsle 1996; Laver 1999; Laver and Benoit 2003; Strøm 1994). In this section I conduct a comprehensive review of those theoretical and empirical contributions to the study of political parties that made the strongest impact on the development of understanding of mechanisms which characterise the internal lives of political parties in the field.

The ability of individual politicians and party members to alter the course of action of a party is often argued to be perhaps the most crucial trait that every political party possesses (Riker 1990; Shepsle 2006; Tsebelis 1990; Weingast 1996). As follows from this rationale, strategic behaviour of rational and selfish individuals hoping to maximise utility of their actions in keeping with their personalised list of ranked preferences has been emphasized broadly in the scholarship on political parties (McCubbins and Thies 1996). Individual and independent actors form the hierarchy of a political party as rank-and-file party members and officials motivated by desire to win elections, hold political offices and implement their preferred policies (Schlesinger 1975; Strøm 1990). It has been demonstrated that party members select party leadership from among themselves and modify its composition (Heller 2013; Schofield and Sened 2002). Evidence exists that political parties field candidates in the elections to legislative bodies, who, if successful, become party-affiliated office holders (Aldrich and Bianco 1992). Activists responsible for the efficient functioning of the party's electoral machine have been shown to be capable of forcing party officials to comply with their ideological demands (Miller and Schofield 2003; Schofield and Sened 2005). The general tendency in the studies of multiparty political

competition emerged along the lines of these insights to describe the explanatory framework, where political parties are understood to be organised and function through strategic interaction of individuals and under heterogeneous and country-specific institutional constraints¹ such as electoral laws and legislative procedures (Bowler, Farrell and Katz 1999; Cox and McCubbins 2005; Cox and McCubbins 2007; Heller and Mershon 2009; König, Tsebelis and Debus 2010; Laver 1999; Laver and Schofield 1998; Laver and Shepsle 1996; Mershon 2001; Mershon and Shvetsova 2013; Schofield and Sened 2006; Schofield 2007; Thies 2001; Tsebelis 2002). Parties are described as internally divided non-unitary entities - coalitions of individual politicians formed to pursue common goals of attaining public offices through the process of nominating candidates and ensuring their electoral success (Heller and Mershon 2009; Mershon and Shvetsova 2013; Schofield and Sened 2006; Taylor et al. 2014).

While there appears to be a growing consensus towards the notion of political parties as non-unitary entities (Giannetti and Benoit 2008), certain divergence in exactly how various accounts conceive of intra-party life lingers on. Schofield and Sened (2006) and Schofield (2007) underscore the centrality of ‘valence’, a measure of popularity and electoral strength of the party, its leadership and candidates based on perceptions of the voters and empirically confirmed to originate exogenously through determination by external forces and endogenously by virtue of the internal collaboration of activist groups supporting the party (Schofield and Sened 2006, 16). The electoral methods of seat allocation are emphasized. With regard to electoral systems where plurality rule is used Schofield and Sened point out that:

...coalition formation principally takes place inside the party rather than outside (Schofield and Sened 2006, 206).

This mainly implies that discrepancy in policy positions occurs within the party and to a large degree involves interaction of party officials and the activist base, where the party seeks to obtain campaign resources and activists to influence the policy of the party (Aldrich and McGinnis 1989). Schofield and Sened (2006) contend that activist politics may exist in systems with proportional representation, which they illustrate with the case of the Netherlands. Therefore, it is reasonable to suggest that in situations where internal politics has such a strong bearing on the party’s existence, it is the policies proposed,

¹ This study subscribes to the commonly accepted in political science definition of institutions as ‘formal or informal procedures, routines, norms and conventions embedded in the organizational structure of the polity or political economy’ (Hall and Taylor 1996, 6; Ostrom 2015; Riker 1990; Shepsle 1989).

discussed and adopted collectively by the party leadership and membership that voters take into account when making their decision at the polling booth.

If according to Schofield and Sened (2006) politicians regard the game of setting policy preferences as a vehicle for electoral success, Tsebelis (2002) places policy at the core of his interpretation of every coalition-building exercise:

...all the actors in a political system whether they are voters, representatives, or political parties care about policy outcomes either directly or indirectly - either because they have preferences over outcomes or because other things they like (like reelection) depend on policy outcomes (Tsebelis 2002, 33).

Politicians and voters then should have well-defined and comparable policy preferences, as otherwise political parties would not be able to communicate their policy message to the members of the electorate and compete for their votes. In other words, policy preferences can be positioned as ideal points of the actors on a policy scale of at least one dimension - which is something that Tsebelis and Schofield use extensively in their spatial models of party politics (Schofield 2007; Tsebelis 2002).

Collective and individual elements of intra-party politics have been at the forefront of empirical and theoretical research in political parties. In addition to the production of theoretical models of inter-party competition and legislative politics, internal divisions in political parties have been brought to light in the examination of a multitude of collective institutions on intra-party decision-making. Institutional phenomena such as the role that distribution of offices in legislative committees and appointment of junior cabinet ministers play in coalition formation process (André, Depauw and Martin 2016; Carroll and Cox 2007; Heller and Mershon 2008; Thies 2001) and the impact of bicameralism and regional autonomy on policy positions inside political parties (Heller 2001, 2002; VanDusky-Allen and Heller 2014) have received and continue to attract a great deal of attention. This long-standing focus on legislative politics in all diversity of its institutional devices gave birth to the theoretical and empirical study of legislative party switching where individual legislators, and not political parties, are shown to be responsible for structural transformations of party systems in all kinds of institutional environments (Mershon and Shvetsova 2008; Mershon and Shvetsova 2013).

1.2. Factions in the theory of intra-party politics.

It is safe to observe that an overall convergence on the validity of the proposition that political parties are non-unitary, fragile groupings susceptible to external shocks and internal struggles exists in the field. I elaborate on this conclusion by conducting a review of recent literature which, in a significant departure from the established theory, deals exclusively with the patterns and strategic aspects of collective intra-party bargaining.

Political scientists started pondering various ways of defining a faction already several decades ago (Ceron 2012). Zariski's description of a faction may be seen as one of the most general ones:

we might define a faction as any intra-party combination, clique, or grouping whose members share a sense of common identity and common purpose and are organized to act collectively-as a distinct bloc within the party- to achieve their goals (1960, 33).

Other definitions have been suggested on the basis of possessing distinct goals (Sartori 1976), having own leadership (Janda 1993; Nicholas 1965) or having organised structure and being institutionalised (Boucek 2009; Rose 1964). Factions can be identified within parties in many countries. If factions are able to make an impact on their party's policy, their interaction should somehow affect the party's electoral support. If a faction is strong enough to force a modification of a party's official policy, and such a course of action becomes its principal aim, it is likely to use its strength to achieve it. As Zariski notes, the goals of a faction:

... may include any, several, or all of the following: patronage (control of party and government office by members of the faction), the fulfilment of local, regional, or group interests, influence on party strategy, influence on party and governmental policy, and the promotion of a discrete set of values to which members of the faction subscribe (1960, 33).

To put it simply, politicians organise themselves into factions at various levels within their respective political parties in order to promote distinct policy agendas in a coordinated and coherent fashion while continuing to claim public adherence to the official policy advocated by the party as a whole. Just as many all-encompassing formal theories have originated through empirical investigations of particular institutional arrangements (Cox and McCubbins 2007; Laver 1999; Filippov, Ordeshook and Shvetsova 2004), the study of factions appears to have arisen in country-specific contexts. Factionalism in political systems of such countries as Italy, Australia and Japan has been historically viewed as a prominent phenomenon which is discussed publicly and sometimes formalised in organisational regulations of political parties, all of which encouraged researchers with a corresponding regional focus

to carry out their analyses with a formal theoretical concept of factionalism in mind. Factionalism in the Liberal Democratic Party of Japan (LDP) (Cox and Rosenbluth 1996; Cox, Rosenbluth and Thies 1999, 2000; Giannetti and Grofman 2011; Kato 1998; Kohno 1992, 1997; Leiserson 1968; Ono 2012), intra-party politics of Christian Democracy and other parties in Italy (Giannetti and Laver 2005; Giannetti and Grofman 2011; Kato and Mershon 2006; Sartori 1976; Zariski 1965), the internal divisions of Australian parties (McAllister 1991; Mulé 2002) and factions of Uruguayan parties (Magar and Moraes 2012; Moraes 2008; Morgenstern 2001) have all been in the focus of formal game theoretic and quantitative empirical work. This comparativist perspective is strongly linked to the institutional study of cabinet formation process, candidate selection mechanisms, regionalism and federalism, plurality and proportional representation-based electoral systems, and legislative politics in presidential and parliamentary democracies.

Whereas the case-focused approach undoubtedly dominates the research on factions, it is worth discussing those scholars who chose to centre their efforts to formally model intra-party politics on the concept of faction (Boucek 2002, 2009, 2012; Ceron 2012, 2014, 2015, 2016). Ceron (2012), inspired by the strategic framework established by Hirschman (1970) to facilitate analysis of endogenous organised entities, describes a game-theoretic model of interaction taking place between the leader of the party (and its majority faction) and the minority faction. The remarkable novelty of this analysis is the use of a faction as the unit of analysis (Ceron 2012, 33). The game is an elegant ultimatum bargaining game for policy and office benefits where the homogenous (that is, united and indivisible entities, all members of which espouse the same policy preferences) majority and minority factions can choose to compromise, accept the proposal or break away from the party, all of which are costly strategies. It is assumed that the actors are perfectly aware of everything that is happening inside the party. That is, there is no uncertainty regarding strategies and outcomes of the bargaining game. Boucek (2012) takes a different approach by distinguishing between factions organised formally and disorganised factions. She argues that the use of game theory is most appropriate to conceive of the latter, as individual decision-making of factional members not grouped together in voting blocks predominantly governs the logic of factionist interaction (2012 48, 49). This conclusion leads Boucek (2012) to structure her narrative of several cases of factional splits that happened in the Conservative party of the United Kingdom in 1981-1994.

Despite the differences in focus and methodology, the whole body of literature on factionist interaction is united by the core logic that can be expressed as the following. If all politicians care about policy and not only about the goals of attaining office and vote maximisation (Schlesinger 1975; Strøm 1990; Müller and Strøm 1999), it is then logical to assume that party members, be they incumbent office-holders or rank-and-file activists, will be inclined to defend their personal policy positions should internal disagreements arise - a non-controversial assumption advocated by Strøm (1990) and Mershon and Shvetsova (2013, 33) among others. Then, a proposition that individual party members and legislators need to be organised to exercise leverage inside their political party rationally follows and has been demonstrated as true (Bäck, Debus, and Müller 2011). They may do so by grouping into factions around a more narrowly defined version of the party's platform (Debus and Bräuninger 2009). If the previous literature successfully applied the concept of the core to describe the majority policy consensus in the legislature and electoral field among parties (Aldrich 1995; Mershon and Shvetsova 2014; Schofield 2007; Tsebelis 2002), then it can also be that individual legislators (and ordinary members) belonging to the same political party may unite in two or more such subgroups (factions) to promote differing policies inside the same party. Most of the research on factions concentrates almost exclusively on modelling and measuring the impact of specific institutional arrangements on intra-party organisation, while Ceron's (2012) and Boucek's (2012) efforts represent perhaps the only extensive attempts to construct a complete and consistent picture of intra-party politics through formal theoretical modelling.

1.3. Voters and intra-party politics.

Many authors contend that electoral institutions and political parties should be studied jointly, since the influence that the rules of electoral competition have on the internal structure of parties makes them closely interrelated subjects of inquiry (Cox 1997). It goes without saying that voters, the ordinary members of the general electorate, have an immense part to play in affecting the outcomes of elections regardless of the particular type of electoral system. As parties are understood as key agents of electoral competition (Taylor et al. 2014), the existence of a connection between intra-party politics and voting behaviour is self-evident. Yet in order to explore the association between factionalism and voters in detail a broad overview of relevant scholarship is required.

It might come as no surprise to somebody even superficially familiar with the literature on the subject of voting behaviour that the accumulation of theoretical and empirical knowledge related to it has a long and rich history. The first major contributions to the theory of voting behaviour were made by Kenneth Arrow (1951) and Anthony Downs (1957), resulting in the advent of rational choice and economically minded discourse on voting in political science (Riker and Ordeshook 1973; McCubbins and Thies 1996). Arrow's 'impossibility theorem' (1951) essentially named the conditions needed to be met for a voting system to facilitate complete transition of all voter's preferences into a society-wide preference ranking when the number of alternatives is no less than three, while Downs's 'paradox of voting' (1957) stated that costs of voting for a rational, self-interested voter² should always exceed the benefits. These theses informed and directed much of the research conducted on voting in the next several decades (Hinich and Munger 1997). The stark dissonance between the Downsian logic of voting and the reality where individuals do actually vote in elections made discussion of rationality and calculus of voting one of the major foci in the literature, producing diverging accounts of the composition of individual voter's utility of voting and rules of their behaviour with economic undertones and emphasis (Aldrich 1993; Blais 2000; Bäck, Teorell and Westholm 2011; Feddersen 2004; Ferejohn and Fiorina 1974; Fiorina 1981; Grofman 1993; Linhart 2009; Morton 1991; Riker and Ordeshook 1968; Sigelman and Berry 1982; Ordeshook and Zeng 1997; Palfrey and Rosenthal 1983; Panagopoulos 2008; Taylor and Yildirim 2010). A separate, independently conceived notion of strategic voting implying a more sophisticated and less strictly mathematical optimisation of own benefit by individual voters driven by their social upbringing and psychological traits emerged in Duverger's (1954) seminal study of political parties and gradually came to have a significant bearing on the way of thinking that students of voting behaviour deployed (Beck et al. 2002; Campbell et al. 1960; Darmofal 2010; Druckman 2004; Druckman and Lupia 2006; Funk 1999; Gerber and Rogers 2009; Kuklinski et al. 1991; Lewis-Beck 2008; Miller and Shanks 1996; Redlawsk 2004; Sokhey and McClurg 2012). Rational choice and social cognitive schools principally differ on the question of information aggregation by voters. The former sets about solving this problem by bringing the concept of information uncertainty into play and assuming that rational voters will seek to acquire information (Clough 2007; Matsusaka 1995; Ordeshook and Palfrey 1988; Shepsle 1972). A classic example of

² A rational voter is the one that always has a transitive preference ranking of alternatives from worst to best and will always be able select the same best alternative of the same set on offer by adhering to such ranking and regardless of any irrelevant alternatives not included in the ranking (Arrow 1951; Downs 1957; Hastie and Dawes 2010; Lau and Redlawsk 2006).

rational-choice approach to modelling voting behaviour with uncertainty is Cox's (1987) three-candidate plurality elections model where voters lack certainty with respect to each other's preference ranking. The latter goes about the issue by assuming minimal information needs for voters concerned above all about their preferred candidates as dictated by their social and psychological instincts and rejecting the idea of information acquisition by voters (Sears et al. 1980; Sears and Funk 1991). A third perspective, cognizant of recent advances in behavioural science and experimental psychology and founded on evidence from surveys and experiments collected over past several decades, allows for limited, or 'bounded' rationality (Kahneman 2003; Simon 1991) in voters, whose decision-making is largely intuitive, but who do actively search for moderate quantities of evidence in support of their intuition (Bendor 2010; Lau and Redlawsk 1997; Lau and Redlawsk 2006; Lupia, McCubbins and Popkin 2000; Popkin 1994). The discussion on the cost of voting is particularly important for this study: as the consensus of the large section of the literature has formed around the idea that voters' information-gathering and material costs are negated by the utility gained due to abiding by the strong social norm that imposes a civic obligation to cast a vote on them (Aldrich 1993; Blais 2000; Downs 1957). Most recently, Gerber, Green and Larimer (2008) have presented the evidence from a field experiment in support of this point.

Game theoretical applications in theory of intra-party politics have been generally slow to embrace the advances in voting behaviour research, and there are few instances of such fusion taking place. Usually, when the voters are included in a formal model describing interaction of political parties or intra-party mechanisms, they are depicted as generic Downsian rational individual electors with interest in policy. In Mershon and Shvetsova's (2013, 38-39) interpretation, voters also pay close attention to the individual incumbent legislator's party loyalty and to the perceived variance of this legislator's policy positions. The loyalty is defined through the legislator's party switching history such that a decrease in its value corresponds to an increase in the incumbent's changes in party affiliation (Mershon and Shvetsova 2013, 41). Individual voting has also been presented in terms of contributing to the candidate given that the size of such contribution does not exceed the valence of the candidate (endogenously derived from resources deployed by the candidate in the campaign and reliant on exogenous strength of the candidate's image and policy positions) minus the policy distance from the voter's ideal point (Schofield and Sened 2006, 188-189). The approach is then to condition a candidate's strategy on the positions of such activist voters, so as to demonstrate how a compromise

vote-maximising position is chosen by the candidate to address activist demands of varying essence (Schofield and Sened 2006, 193). In Ceron's interpretation, which is the only robust game-theoretic examination of intra-party politics putting factions at its heart, voters' response is inscribed on variables connected to the electoral process, while publicly expressed discontent hurts the image of the party and deters voters (2012, 20, 21, 41). That is, in Ceron's (2012) model voters are not active participants of the decision-making process in the game, and the accumulation of votes by parties in elections is thus affected by the outcomes of the intra-party bargaining automatically.

There is more than enough room for improvement: just as the faction-based models of intra-party bargaining tend not to have voters in them, advanced theory of intra-party bargaining disregards the notion of factions. A model combining factionist bargaining and voter agency is warranted. Proceeding with the rational-choice set of assumptions about behaviour of consolidated factions (Boucek 2012; Ceron 2012) and individual voters (Downs 1957), I sketch a simple foundation for such a model. Suppose that, if voters indeed care about policy and are willing to support their preferred positions, it is possible that they may support a party, some of whose office-holding members declared positions directly appealing to them, even if the official party policy is somewhat different from their ideal point. If parties are non-unitary entities, as argued by Laver and Schofield (1998), Schofield and Sened (2005) and Mershon and Shvetsova (2008, 2013), and voters can at least to some extent be viewed as rational policy-driven information-seeking utility maximizers (Bendor 2010; Lau and Redlawsk 2006), then from the analysis presented above stems a valuable conclusion: voters may be considering not just to the policy positions of parties or particular candidates, but also the policy positions of the factions of particular parties. A faction, understood as a collective and homogenous actor trying to influence how their party's policy is set, must consider whether their position has support of a sufficient number of their party's constituents regardless of their size as a proportion of all ordinary and office-holding members of the party. This is necessary for them to actively and confidently promote their chosen policy position and compete on it against opposing factions. At the same time, a rational faction should strive to preserve the fraction of the party's voter base needed for it to be able to achieve electoral victory. Rational and strategic voters should also be willing to take these circumstances into consideration in order to be able to cast their votes for the right candidate and see their preferred policy implemented (Battaglini, Morton and Palfrey 2010; Fox and Shotts 2009; Greene and Haber 2015). The existing experimental research on the impact of partisan endorsements on voting behaviour (a

subject widely referred to as ‘party cues’) lends additional weight to this reasoning, as voters have been found to have strong reactions on issues of importance (Brader and Tucker 2012, 115) and can be hypothesised to behave similarly when intra-party position taking is considered. In other words and in accord with the rational choice logic of earlier studies, factions and voters must seek to overcome information uncertainty by all means possible (McKelvey and Ordeshook 1985; Schofield and Sened 2006).

1.4. The empirical research on factionalism.

One of the aims stated in the introduction to this study is to lay the groundwork for a versatile and in-depth empirical evaluation of the theoretical findings presented in Chapter 3 of this study. In this section I acknowledge the progress that has already been achieved, discuss the methodological character of empirical research on factionist politics and identify aspects where novel contribution can be made and suggest means of doing so.

A common pattern unites all empirical investigations into factionalism. The first step is to select a specific institution or set of institutions related to factional politics or affected by it and examine it as an explanatory variable (variables) or dependent variable (variables). Most studies cited in section 1.2 of this chapter represent in-depth exploration either of the impact of factionalism on a dependent variable of interest (such as influence of the degree of intra-party factional division on portfolio allocation in LDP cabinets in Japan in Ono (2012)) or of the impact of some explanatory variable on intra-party setting (Cox, Rosenbluth and Thies (1999) conduct analysis of the relationship of electoral system change in Japan on the intra-party organisation and institution-specific strategic behaviour in LDP). With the aim to aggregate, systematise and innovate previous research, Ceron (2012) presents a comprehensive set of theoretical predictions encompassing a broad array of institutional and intra-party variables and empirically tests hypothesised relationships between these to describe factions both as predictors of institutional or behavioural change and its objects. The evaluation of formal models involves solving the problem of operationalisation of key variables employed in such models (Morton 1999). In other words, theoretical categories deployed in such formal models need to have a quantifiable counterpart in real-life setting. Ceron (2012), Laver (1999), Schofield and Sened (2006) and other authors directed by their game theoretical analysis aim to construct variables from data on intra-party institutional devices interpreted as causative with respect to the magnitude of change in

actors' payoffs. For instance, Ceron approaches measuring party loyalty, one of the key payoff variables in his model, by examining observations describing the age of political parties in his dataset and registering change in party symbols at party congresses (2012, 205).

The next step is to choose a country or a group of countries for the purposes of data collection. The standard procedure is to target printed sources for subsequent input and analysis with the help of suitable statistical models and techniques (Diermeier and Stevenson 1997; Döring 1995; Mattson and Strøm 1995). The nature of the unit of analysis is such that the task of obtaining quantitative data on factional behaviour appears to be cumbersome. Delineating factional affiliation among members of same political party is difficult mainly because factions are rarely formalised in a way that is documented and placed in the public domain: their membership composition alters informally and their numbers change frequently, as stressed by Ceron:

...we should be aware that factions are not fixed as well. Instead they are an endogenous output of the intra-party environment and the party system. Along this line we retain that it does not make sense to treat them as stable. Even organized factions in fact might divide and recombine themselves across subsequent party congresses (2012, 23-24).

In certain country-specific contexts characterised by the presence of formally constituted intra-party factions (such as Italy and Japan) it is at times possible to obtain consistent and verifiable data on even the tiniest items belonging to the realm of daily factionalism, such as indicators of persistent factional allegiance of particular politicians and records of meetings of intra-party bodies (Boucek 2009; Ceron 2012; Giannetti and Benoit 2008; Kato and Mershon 2006; Mershon 2001). However, it goes without saying that avenues for conducting survey research on a sample of representatives of factionalised parties in the majority of cases are somewhat limited. Therefore, scholars of factional politics have in the past actively and successfully sought to simplify the task of obtaining data by specifying the level of party organisation, at which such data might be present in the most transparent, sustainable and accessible state. National and regional legislatures have been practically proven to be the right places where behaviour of politicians, manifested chiefly in parliamentary debates, speeches and voting, is continuously observed and recorded (Bernauer and Bräuninger 2009; Curini and Martelli 2010; Giannetti and Pedrazzani 2016). The records are then released to the general public through the official parliamentary printed sources or press releases to the media. Results of primary elections of official party candidates and elections to intra-party governing bodies, where ideological position-taking is

practised by contesting politicians, are in some cases documented and publicised to an extent sufficient for the appropriation for scientific use. Political positions can also normally be identified by means of consulting election manifestos, interviews and opinion pieces published by credible media organisations (Budge, Crewe and Farlie 2010; Tresch 2009). Several issues are often encountered while constructing a dataset for analysis in the study of political parties. Coding is one of the most important of them, as consistency of categories and labels used in production of quantitative datasets is directly affecting the validity and subsequent replicability of findings (Benoit, Laver and Mikhaylov 2009; Volkens, Bara and Budge 2009). Locating policy preferences of political actors and ensuring validity of policy position estimates is a challenge that remains at the heart of comparative research on political parties (Benoit, Bräuninger and Debus 2009; Laver and Garry 2000; Volkens 2007). This is the reason why indices have in the past been introduced to accommodate the need for viable transposition of theoretical concepts onto the data available (Ceron 2012; Dalton 2008; Dalton, Farrell and McAllister 2011; Shapley and Shubik 1954; Straffin 1977; Warwick 1994).

On the contrary, experimental research on intra-party politics occupies an infinitesimally small space in the landscape ruled by statistical applications and rich cross-country or country-specific real-life data (Giannetti and Benoit 2008). Natural experiments with institutional change have been identified and studied, notably for the case of electoral reform in Italy and Japan (Giannetti and Grofman 2011). Laboratory experiments that come closest to the focus on intra-party politics are those centred on the subject of legislative and coalition bargaining (Palfrey 2009). Policy positioning through voting and bargaining in the laboratory with various institutional specifications was examined by Fréchette, Kagel and Morelli (2005), Fréchette, Kagel and Lehrer (2003), Battaglini, Nunnari, and Palfrey (2012), Drouvelis, Montero and Sefton (2010) and Diermeier and Morton (2005), among many others. These experiments were initiated as responses and attempts to test the Baron and Ferejohn (1989) legislative bargaining model and were designed as voting and bargaining games. As laboratory experiments allow researchers to have greater control over their substance and outcomes, wider use of this vehicle of empirical evaluation can be optimal and beneficial for the study of factions. The key role of this observation in the research project at hand will be addressed in greater detail in the Chapter 2.

1.5. Summary.

This Chapter contributes to the goal of clearing the field for the discussion of methodology that follows. The logic of the theoretical exploration in the Chapter 3 is informed by the points made in this Chapter as well. Political science has a strong tradition of quantitative empirical research on the intra-party bargaining, some of which is based on the theoretical analysis structured through the formal models specifically tailored to its needs. The most prominent analyses do indeed have a game-theoretical foundation, which evolves around the primacy of the party leadership and activists (Schofield and Sened 2006) or, alternatively, of the individual legislators and voters (Mershon and Shvetsova 2013) in the intra-party processes. The research that draws on the concept of factionalism to analyse the inner lives of divided parties occupies a certain niche in the discipline and is far from being ubiquitous: Ceron (2012) and Boucek (2012) are the authors of the key large-scale studies that suggested generalising the intra-party politics by centering their inquiries on factions. The existing empirical studies deal mostly with the observational data on parties and elections, although the model-based experiments on individual voting behaviour of voters and legislators have gained prominence in the past two decades. The core takeaways from this literature review are: first, that the game-theoretical analysis of factionalism in political parties is appropriate under rational choice assumptions made about homogenous, individual-like factions that are formed by the members of the same party; second, that the present state of the theory of intra-party bargaining could be improved by bringing policy-motivated homogenous factions and voters together in a formal model of intra-party bargaining with electoral uncertainty, a novel approach that has not to this date been tested in the scholarship; third and final, that the experimental design could be a useful and insightful extension to this.

Chapter 2. Research methods.

2.1. The hypothetico-deductive method and formal modelling.

The discussion in Chapter 1 demonstrated the urgency of the need to address the gap in the research on intra-party politics that exists with respect to the collective bargaining aspect of factional interaction. One of the key remaining challenges in structuring the argumentation of the theory of intra-party bargaining that I was able to identify is mainly related to the relationship between internal processes of a political party and the power to determine its electoral fate that its voter constituency wields. I have shown that this problem, upon closer examination, reveals a pattern of strategic behaviour on the part of intra-party as well as extraneous actors. Several prominent studies have attempted to model intra-party politics by means of applying game theoretical instruments to carve the strategic decision-making processes from a set of basic assumptions and predict their outcomes in a robust manner. Yet, none of these have succeeded in building an overarching formal theoretical account of intra-party politics which would not only embrace the organised features of internal divisions occurring in parties, but would also incorporate the role that voters have in tailoring the patterns of conflict between opposing groups of politicians united by their common party affiliation. The present section outlines the methodological cornerstones that such account has to be founded upon, details the core steps one should follow in developing it and deals with the strengths, weaknesses and concerns pertaining to formal modelling in political science.

The analytical framework that I intend to follow in this study is suggested by Jon Elster (2015) in ‘Explaining Social Behavior: More Nuts and Bolts for the Social Sciences’. To put it simply, Elster insists that any optimal analytical arrangement should be rooted in an established, logically consistent theoretical framework, which should serve as a blueprint for each step of the analysis. The duties of a theorist do not simply boil down to demonstrating the existence of a causal link between the dependent variable of the study and the independent variables said to be affecting its state. One has to show such link can be characterised as a mechanism - a ‘frequently occurring and easily recognizable causal pattern that is triggered under generally unknown conditions or with indeterminate consequences’ (Elster 2015, 36). The goal that logically follows once the mechanism underlying the relationship in question has been identified is to specify the conditions, under which such a mechanism can evolve. Testable hypotheses should be constructed with theory being the primary reference point for them. In the final stage of the process, the hypotheses are evaluated empirically. This is accomplished by means

of developing alternative statements and subjecting these, juxtaposed to the originally proposed hypotheses, to vigorous scrutiny. The procedural direction I have just described is widely used in social sciences (Morton 1999) and is referred to as the hypothetico-deductive method (Elster 2015, 17). Reversing this schedule or altering the order of its parts would be considered as ‘cheating’, meaning that data analysis cannot come before the meticulous theoretical understanding is devised.

It is always desirable that a theoretical framework is powerful and capable of producing intuitive explanations of studied phenomena. However, even the most appealing and convincing accounts can fall victim to fallacies, internal contradictions and factual inaccuracy. The easiest way to fall into a trap of logical inconsistency is to frame the theoretical argument of the study as an unsubstantiated narrative by means of utilising implicit assumptions about the reality, in which the object of inquiry is said to exist. I presume that there is no malice in the motives of a researcher: if there is any, a vigorous peer review process should prevent fraud being committed by the members of scientific community. Yet even a researcher with her heart in the right place can still quickly lose the train of her thought caught up in an attempt to construct an informally narrated explanatory model from a verified fact or a collection of such facts. Morton (1999, 35) points out that this exercise of nonformal modelling, however heuristically suitable for the purposes of initial exploration of the studied phenomenon, cannot suffice as a path to subsequent empirical evaluation. The urgency of the task lying ahead of any scholar who seeks an in-depth, scrupulous interpretation of the part of the world falling within the scope of their research endeavour is such that only the finest-tuned instruments can lead them to success. Mershon and Shvetsova (forthcoming, 6) contend that it is the formal models that are logically wholesome thanks to the mathematical laws keeping their elements and intrinsic relationships consistent that are the best antidote to confusion and errors in scientific analysis.

Thus, reaching the aims of this project should involve constructing a formal game-theoretic model of factional behaviour. Such a model has to constitute an abstract and simplified representation of the bargaining process taking place inside a political party to decide on an official policy platform of the party. It is paramount that the model works on the premises derived from fundamental intuitions regarding the internal processes of a political party in a democratic political system, so that the predictions resulting from it can be operationalised to pave the way for a rigorous empirical assessment (Morton 1999, 55). Achieving my primary aim is made possible by fulfilling certain requirements. First

and foremost, a step away from the real-world examples of intra-party bargaining situations such as those described in the introduction to this study has to be taken to vacate the space for a set of basic assumptions to be put in place. As Morton puts it

A nonformal model becomes a formal model when a researcher expresses the real-world situation in abstract and symbolic terms in a set of explicitly stated assumptions (1999, 36).

The issue of complexity is central to the effort one undertakes to formulate these assumptions. A foundation that is too general is bound to severely impede any attempt at deriving testable results from the model. An overly simplistic one, while solvable with little difficulty, should greatly limit the predictive power of whatever the findings obtained from the model turn out to be. It is then not surprising that, in the absence of axiomatic laws that are built into the foundation of theories in natural sciences, political scientists are left with the stark choice: to tone down the quest for the universality of their models in favour of piecemeal yet rigorous explanatory approach, or to take selective statements about human behaviour at face value in hope that the resulting analytical product fits the reality well enough (Elster 2015, 50). Given the absence of already existing simplified formal models of intra-party bargaining, which include individual voters and are based on the concept of factionalism, in this project I will try to occupy the middle ground between these two viewpoints. A foundation that is reliable and respected while enabling me to set out and build an applied formal model is demanded. I will seek to adopt the rational-choice assumptions, since they are commonly accepted and widely used in the formal models of political parties (Laver 1999, Schofield and Sened 2006, Ceron 2012, Mershon and Shvetsova 2013). This will be done with a view to devise a formal, logically consistent and empirically testable model that will serve as a starting point and a foundation for a progressively more complex analysis where these assumptions can be relaxed.

2.2. The bricks and mortar: rational choice theory, spatial modelling and expected utility theory.

It is a good time to ask several important questions. First, what is rationality? Why should we presume that the reality, from which the abstractions in our model will be made, is ruled by the laws of rationality? Are there better substantiated sources, from which assumptions could be borrowed and fed to the model under consideration? This section will discuss the logic of rational choice theoretical framework, its core features, strengths and weaknesses, as well as the part that calculus and game theory can play in its application to the study of intra-party factionalism.

Let us recall the roadmap for this study that was outlined in the introductory part. The primary aim is to develop a structured and straightforward theoretical model which can be used to shape the main argument and its implications and is suitable for the subsequent translation into the language of empirical research. Clearly, in order to cross this aim off the list I have to seek to attain a sufficient level of simplicity. This entails constructing a foundation by assuming certain statements to be true and hoping that this is confirmed later on in the empirical section of the study. The key assumption made about individual behaviour in rational choice game theory is that individuals have and actively cultivate evidence-based beliefs, which help them make informed decisions rationally (Elster 2015, 191). It is intuitively attractive and is in part echoed by the behavioural experimental research into the psychological features of individual decision-making, which demonstrated that information gathering indeed takes place and is facilitated by the use of automatised cognitive heuristics embedded in the mind of an average human being ³ (Anderson et al 2004; Kahneman 2003; Simon 1991). There are of course additional limits that can be imposed on the information acquisition by a rational individual voter or politician that can be interpreted in terms of direct and opportunity costs of making a decision (Elster 2015, 214). For the purpose of increasing the intrinsic simplicity and coherence of this analysis disregarding these constraints while modelling the individual choice of actors appears to be both optimal and realistic⁴. Thus, politicians and the members of electorate can be described as rational information-seekers, whose decisions are evidence-based.

If the individuals involved in electoral competition have rational beliefs that are translated into informed choices, then what are the outcomes, with which these beliefs are associated? The relationship I aim to analyse is closely tied to the positions that candidates and political parties adopt with regard to various policy considerations that voters tend to pay attention to. As was mentioned

³ The established consensus acknowledges that while ‘people generally want to make good decisions’, they are constrained by the cognitive limitations of human mind and generally tend to deploy automatised cognitive information processing techniques, or heuristics, to optimise their decision-making process (Lau and Redlawsk 2006, 25)

⁴ It may be argued that higher the price of information on the prospective balance of support for political parties in the electorate on the polling day and the more difficult it is to obtain an exhaustive account of the policy profile of each candidate, the smaller the rational individual effort directed at obtaining such information should be. Still, as opinion polling information is publicly available from a variety of media that voters come in contact with daily, and the information on any issue of the campaign will normally be attained by voters at little to no cost, helping them reach a decision that is ‘right’ and ‘easy’ at the same time (Lau and Redlawsk 2006, 14).

earlier, rational decision-making in politics must follow from the individual preferences to the policy outcomes of an electoral process that are transitive in the sense of being distinct and ordered from the worst to the best (Arrow 1951; Elster 2015). The key challenge then is to map the policy preferences of political actors in a way that allows for them to be subjected to measurement and comparison. The spatial representation of political competition is a ubiquitous and widely accepted instrument that I will apply in order to resolve this challenge (Downs 1957; Schofield 2007; Tsebelis 1990, 2002). The value of this approach to this study is crystal clear: it allows for the positions of factions and voters concerning a policy issue to be assigned unique locations - ideal or bliss points (Schofield 2007, 126; Tsebelis 2002, 37) with specific cardinal values on a spatial Euclidean scale. Such an arrangement would belong to a class of proximity spatial models of electoral competition, as the pleasure that actors derive from the policy that ends up being implemented after the election (i.e. the winning policy point) is described as a monotonic function of the geometrical distance to it from their ideal policy points (Merrill 1995)⁵. In other words, the farther the ideal point of an actor is from the policy point of the party or coalition that forms the government, the smaller the utility gains are for this actor.

Once the policy preferences of political actors are outlined on a policy space, the analysis of their decision-making becomes truly possible. Naturally, the pressing methodological concern lying at the very heart of such analysis is related to the concepts that should be incorporated into it. A glance at several commonly known features of democratic elections should aid in the process of composing an appropriate analytical toolkit and justifying its contents. First, since electoral outcomes are notorious for often being unpredictable or at the very least unstable, the notion of uncertainty immediately comes into play. This inevitably leads me to consider the expected utility theory, a framework that provides the techniques needed to manufacture the basic building blocks of a model with uncertainty - the expected utility functions of the actors (Von Neumann and Morgenstern 1944). The theory is known as the dominant approach to dealing with uncertainty and underpins most of the extant formal game theoretical models of politics (Morton 1999, 147). Given that the preference ranking that actors have over their decision-making outcomes remains unaltered regardless of the presence of irrelevant alternatives and the change in probabilities that are assigned to each alternative on the list (that is, when the preferences over policy outcomes are independent and continuous), a politician or a voter can be

⁵ Rabinowitz and Macdonald (1989) advocate a directional spatial model, where the actors are permitted to hold preferences over the same policy issue that vary in terms of intensity. This study takes advantage of the geometrical proximity model.

assumed to have an expected utility over any choice they make (Aliprantis and Chakrabarti 2000, 37; Morton 1999, 148). The expected utility, which in the context of a game is referred to as a ‘payoff’, is defined as the sum of the utilities of various alternative winning policy points multiplied by the probabilities (that is, the likelihoods) of their occurrence, which is referred to as the addition rule (Dixit and Skeath 2004, 224)⁶. Reflecting the atmosphere of uncertainty, in which any election is shrouded, a political actor forms the rational belief about the likelihood of a particular electoral outcome based on the probabilistic evidence they obtain. To put it plainly, the concept of expected utility paves the way for such analytical aggregation of the political actor’s preferences over policy outcomes that will also include the measure of the likelihood the actor attaches to each outcome.

2.3. Extensive form games, noncooperative game theory and uncertainty.

The previous section revealed that rigorous assessment of the individual preferences of the actors in the prospective formal model as well as the expectations that these actors have to the potential outcomes of their interaction can be made possible through the combined application of spatial modelling and expected utility theory under the assumptions made in rational choice theory. The next step of the process is then to ensure that the theoretical argument regarding the exact patterns of behaviour of factions and voters that is being put forward in the Chapter 3 of this study possesses internal logical consistency and is compatible with the assumptions it stems from. In this section I discuss in detail the instruments and guidelines from the noncooperative game theory that I will take advantage of in the process of constructing the model of factional bargaining, emphasise the sequential character of interaction between the political actors and clarify the primary purpose of model building - the search for equilibrium solutions to the intra-party bargaining puzzle.

There can be no doubt that the relationship between intra-party actors and the electorate should be modelled as an extensive form noncooperative game. The term ‘extensive form’ refers to a class of the game theoretical models of strategic interaction, under which the choices of actors are made sequentially (Aliprantis and Chakrabarti 2000, 115; Dixit and Skeath 2004, 46), - an approach that is perfectly suitable to the complex situations in electoral competition where non-unitary parties and

⁶ In keeping with the goal of creating a model that will serve as a starting point for a larger conversation, I make a simplifying assumption by assigning the actors to have a neutral attitude to risk and a strictly linear utility function (Aliprantis and Chakrabarti 2000, 40).

voters are put in focus. Just as the actors engaged in a game have a ranking of preferences over its outcomes, they must be plotting the policy space mentally and thinking strategically about their own moves and the moves that their opponents, the other players, might want to make. It is only normal to expect the faction leaders to be prepared for all alternative situations that can arise from each of the number of decisions that their colleagues in the party may make. The game of the majority and minority factions by Ceron (2012, 36) and the party leader-legislator game by Laver (1999, 16), which attribute strictly strategic and sequential logic to the behaviour of factions (politicians), have much in common with my interpretation. At the same time, it is self-evident the internal groups in a political party who care about leading it to electoral success cannot reasonably allow themselves to put off the resolution of their disagreements until the polling day or the beginning of early voting period. In a similar fashion, voters would be taking notice not only of their personal ideological and party sympathies, but also of the institutional constraints (such as the majority rule) that may divert the results of an election in the direction unfavourable to them. This, as well as the fact that the voters' choice is not officially registered until they have cast their vote, has informed the models of legislative party switching and party system change by Mershon and Shvetsova (2013, 38) and of the composite political cycle by Schofield and Sened (2006, 7). While any attempt to outline the complete historical sequence of strategic decision-making of individual politicians and voters or their homogenous and individual-like groups would be cumbersome and hardly feasible, a model of a particular frequently repeated interactive situation - such as the ones of the intra-party policy setting process and the subsequent electoral test, - is a clear-cut possibility and is called a 'subgame' in game theoretical terminology (Aliprantis and Chakrabarti 2000, 142). A decision tree, often referred to as a game tree, is the standard graphical representation of the extensive form game that captures the above-described interaction (Dixit and Skeath 2004, 46). The commencement of a hypothetical interactive situation is marked as a starting point, or the root of the tree, from which the branches divided into a number of appropriately labelled edges denoting the strategies of actors (players) will spread, separated by a new node each time the need for another player to make their move arises; each sequence of edges ends with a terminal node (Dixit and Skeath 2004, 46; Aliprantis and Chakrabarti 2000, 91).

The term 'noncooperative', introduced in the previous paragraph to describe the variety of a game theoretical model that constitutes the heart and soul of this study, is related to the eponymous subfield of game theory that examines the origins of collective interaction outcomes by requiring the binding

mutual agreements between the players to be absent (Gates and Humes 1997, 3). In the case of homogenous factions and voters, the noncooperative approach imposes a highly restrictive definition of optimality on the cooperative outcomes of the players: the outcome can be optimal only when it is self-enforceable (Morton 1999, 82). Thus, the main condition that an optimal solution to the noncooperative game of factions and voters has to meet is that neither a faction nor a voter can switch from their present strategy to a more appealing alternative (Aliprantis and Chakrabarti 2000, 55). What has just been described is in fact the definition of the core concept of noncooperative game theory, the Nash equilibrium (Nash 1951). In extensive form games, such as the sequential-move game of intra-party decision-making and voter response, the optimal combination of strategies (or the 'strategy profile') of the game is defined as the subgame perfect Nash equilibrium - that is, the Nash equilibrium that holds for all subgames of the game (Aliprantis and Chakrabarti 2000, 120, 144). Imagine the case where the supposed Nash equilibrium is that of the political party winning the election with a reformed policy on an issue. Yet if one of the factions desires to introduce a policy reform while being aware that supporting the current party policy on the issue in question carries more weight for it than picking a fight with the rival faction, it will likely be inclined to avoid making a proposal. Then, the optimality hypothesis is rejected. As demonstrated by the example, the appeal that the extensive form noncooperative game projects is undeniably powerful, precisely because this method underscores the endogenous mechanism of the cooperation between players (Morton 1999, 83). A modeller can control for the presence of optimal self-enforcing strategic outcomes at each stage of the sequential game by moving from the branches ending with terminal nodes to the root of the decision tree in order to analytically trace the optimal strategy profiles at all of its stages. Every step of the procedure would involve drawing comparisons between expected utilities of each player for each pair of possible decisions. This technique is commonly referred to as backward induction and is widely applied to solve the extensive form games for all possible subgame perfect Nash equilibria (Dixit and Skeath 2004, 54). The theoretical results - the Nash equilibria with constraints, - that are produced through backward induction can then be used to interpret and predict the behaviour of actors in the model as well as serve as the basis for the future empirical work.

What about the electoral uncertainty and the levels of public support for various policy alternatives? The concept of imperfect information, represented in the form of information sets in extensive form games, is a convenient device that permits a modeller to successfully tackle this complex issue

(Aliprantis and Chakrabarti 2000, 122). That is, whenever the faction or voter are understood to have only partial knowledge of the possible outcomes and make their judgements based on the probabilities of such, the decision tree will have an information set surrounding the nodes corresponding to the actors with incomplete information. The nature, included in the model as an independent ‘actor’, is usually said to determine the likelihood of the alternative states of the world coming into being (Dixit and Skeath 2004, 47).

2.4. Laboratory experiments in political science: design principles and main features.

The multifaceted rationale supporting the idea of building a formal model consists of several important goals. The earlier discussion in this chapter focused to a large extent on the paramount advantage and aim of formal models, which is to reinforce logical consistency of the theoretical argument being made by the modeller by ensuring the linkage between the baseline assumptions made about the relationship under scrutiny and the flow of the argument is finely maintained. This section heralds the second and equally important reason for developing a formal model, which is to prepare the ground for the applied empirical extension to the theoretical foundation of this research (Mershon and Shvetsova, forthcoming, 3; Morton 1999, 24). Here, the case for conducting a laboratory experiment to confirm or reject the hypotheses derived from the proposed model of intra-party bargaining, which was suggested first in the Chapter 1, is made. Next, the methodological aspects of running such an experiment are outlined with references to the research traditions from political science and behavioural economics. The review presented below informs the empirical analysis of the Chapter 4 of this thesis. The ethical considerations as well as the statistical tools to assess the findings of an experiment are examined in the Chapter 4.

Experimentation is a unique approach to investigating relationships with the target of justifying causal inference about the phenomena in focus, which has attained a prominent status in political science since the 1970s (Druckman et al 2006; McDermott 2002). Its singularity is made possible thanks to a distinctive feature that defines the class of experimental methods in social sciences and separates it from observational studies involving human subjects - the concept of randomisation, or random assignment into groups within the sample of participants (Druckman et al 2011, 17). Random sampling, a method that implies drawing a sample of individuals from the population at random and thus ensuring that their probabilities of being included in the sample are equal, is a necessary measure aimed at

reducing the selection bias of the participant recruitment: since individuals differ in many respects, it is upon the researcher to prevent an over-concentration of similar individuals by means of monitored random selection (McDermott 2011, 36). Hence, the experimental evaluation in this thesis must first of all seek to be based on a random sample of individual participants. However, a study based on a random sample does not constitute an experiment, unless the individual subjects are assigned their roles randomly in order to mitigate the presence of cross-group differences in the experiment to the best extent possible (Brader and Tucker 2012, 134; Druckman et al 2011, 17). Without randomisation it is impossible to guarantee the reliability of the average treatment effects discovered (Brader and Tucker 2012, 114). By ‘treatment’ political scientists understand the factors that have a potential to influence the behaviour of participants in the study (Druckman et al 2011, 16). Holt defines a treatment as a

completely specified set of procedures, which includes instructions, incentives, rules of play, etc (2007, 18)

and contends that the best approach to random assignment is to introduce it in the form of a within-subject design, which entails letting each individual subject experience all treatments that are administered, so that all potential differences within the group of such individuals on the variables of importance can be controlled for by contrasting the experiences of this group between the treatments (Holt 2007, 19). The classical between-subject experimental design would normally include treatment and control groups, where the treatment is administered only to the subjects in the former (Druckman et al 2011, 3). To enable comparisons, a within-subject random assignment of treatments would simply need to produce a change in the outcome variable for at least two levels of the treatment variable, one of which would serve as the baseline (Holt 2007, 18). The aim of the experiment, defined in the Neyman-Rubin causal inference model (Neyman (1923) 1990; Rubin 1974), is to allow the researcher to detect the differences in the outcome variable between various levels of the treatment and then prove that these differences are significant and appear due to the average treatment effects caused by the provision of the treatment to the participants, all other variables held constant (Druckman et al 2011, 23). Following this prescription, my experimental design will have to adopt the structure of my formal model and test it for the effects of the explanatory variables on the outcome variables that it predicts (Morton and Williams 2010).

While there are many ways to run an experimental study, the one that appears to be the most fitting in the case of my study is a laboratory experiment. The choice of the laboratory setting, and not a survey

or a field type of design, is motivated in part by the conceptual needs stemming from the complexity of the model that I propose in the Chapter 3 and is preferred by many experimentalists in political science and behavioural economics (Holt 2007, 9; Iyengar 2011, 75). Naturally, the lab is the only place where the experimenter can fully control the procedures of the study from the start to the end with the minimum possibility of noncompliance by the participants. The laboratory space affords the researcher with an extraordinary opportunity to retain even the most sophisticated features of a theoretical model in the experimental design and instruct the participants to act exactly according to the plan set forth in the design (Druckman et al 2011, 22; Holt 2007; Kittel and Morton 2012, 4). Precisely because of these attributes laboratory experiments are widely attested to be performing the best on the internal validity characteristic: laboratory experiments are internally valid since they tend to leave the researcher strongly confident that the treatment effects are significant and have arisen from the finely devised and executed experimental design (McDermott 2011, 28). Of course, there are several important considerations to keep in mind, namely:

1. Some complexity of the original formal design would likely have to be sacrificed for the sake of making the experimental instructions as accessible as possible to the participants (Woon 2012, 59);
2. The researcher needs to sustain a tight grip on the treatment administering, and the optimal means to this end is to reduce the number of treatments, or ‘moving parts’, to two at most in order. This is necessary to avoid subsequent failure to distinguish effects and comes at the cost of the inevitable increase in the indeterminacy, or the weakening of the connection to the theory that stands behind the design (Holt 2007, 20; Woon 2012, 56);
3. The experimental environment would need to preserve at least a minimal degree of realistic context, such as some basic political terminology (such as a ‘leader’, a ‘voter’ or an ‘election’), for the participants have to be comfortable with the procedures they are asked to perform while not being biased by their personal characteristics in doing so (Dickson 2011, 59; Woon 2012, 65).

Clearly, the experimenter has to do quite a bit of hard work to address these points properly. There is a major caveat that is routinely pointed out in the literature when laboratory experiments are discussed - their low external validity. This means that even the most elaborate, balanced and neatly conducted laboratory experiment is bound to be detached from reality both in terms of its structure and context, as well as in terms of the particular sample of participants it is run with (Woon 2012, 59). Very often the most readily available source of experimental subjects is university students, and it is also the most criticised in academia in terms of the presumed low generalisability of findings obtained with it to the overall population (Kam, Wilking, and Zechmeister 2007; Sears 1986). However, an argument to the contrary has been made by Druckman and Kam (2009), who cite the need to concentrate on experimental context and the operationalisation of theoretical variables and the statistical evidence of unbiasedness of student-based samples in support of their position. While the second motivation for this study to incorporate a laboratory experiment as its main empirical method is material and stems from the lack of resources to conduct a large-scale field or survey experiment, there is still room to argue in favour of the high external validity of my experiment. The main remaining issue is that the viable sample size will have to be small and can only be drawn from a pool of students. Monetary incentives are a compulsory element of any laboratory experiment (Dickson 2011, 61), as the certainty (or possibility) of receiving cash payment improves the likelihood that the individual will agree to participate. The inevitable disadvantage of guaranteeing monetary rewards to participants for a self-funded study such as mine is obvious: my resources permitted me to attract and compensate only about a couple of dozens of participants. It is then uncontroversial to expect that, due to the Law of Large Numbers, obtaining statistically significant results is a difficult mission (Angrist and Pischke 2014, 48).

2.5. Summary.

The purpose of this Chapter was to set the stage for an in-depth game-theoretical exploration of the bargaining game between the factions of a governing party competing against each other to determine the official policy that their party will contest the ensuing election on. The first step is to construct a formal model describing the behaviour of factions and the voters of the party sequentially with a decision tree outlining the strategies of the players and with the expected utility equations of the actors for each of its terminal nodes. The electoral uncertainty is to be represented by the imperfect information and probabilities introduced by the nature. The next step involves solving the game for the

Nash equilibria with backward induction to reveal the strategic profiles that are optimal for all players and analyse the resulting outcomes and constraints, under which they remain stable. The solution discovered is then translated into testable hypotheses. The third step is the laboratory experiment aimed at evaluating the theoretical predictions that are expressed in the hypotheses, which deploys the random assignment of treatments based on the constraints to evince the empirical evidence on the validity of the theory. This means that the experimental data is to be statistically tested for the presence of treatment effects.

Chapter 3. The model of intra-party bargaining and voter response.

3.1. The setting of the model, its actors and their strategies.

The formal game theoretical model is constructed in the shape of a one-shot (that is, non-repeated: Dixit and Skeath 2004, 22) extensive form game between the actors - factions of the incumbent party and its voters, - whose strategic behaviour is being considered. The task of reducing the complexity of the analysis demands the actors to be considered risk-neutral decision-makers with a linear utility function of the type $u(w) = w$ (Aliprantis and Chakrabarti 2000, 40). Ceron (2012, 12-13) contends that:

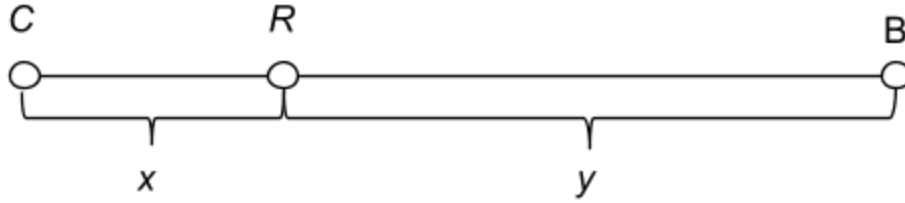
factions are indeed rational actors. They are able to take collective decisions and, likewise parties, often behave as if they were a unitary actor.

This understanding of intra-party factions as homogenous and independent actors permits me to present the intra-party process in terms of the sequential collective bargaining of factions to set the official policy of the incumbent party, A, on an abstract issue, the outcome of which is evaluated by the individual members of the electoral base of the party A. The focus is on the two factions in the party A, which are known to be of equal size and influence. One of the factions (Reformist) supports a change in the policy, while the other faction (Conservative) seeks to defend the status quo policy of the party A. For simplicity, I assume the institutional setting of a two-party system, where the electoral victory means receiving the majority of votes in the election. The incumbent party, A, is divided into two factions, the informal groupings of its members. The opposition party B is understood to have determined its official policy well ahead of the election, and the voters of the party B in the previous election are assumed to be prepared to remain unconditionally loyal to B in the upcoming election. In other words, B does not participate in the game and serves as the last resort for the dissatisfied voters defecting from the party A. The voters of the party A are assumed to be divided into supporters of the policy advocated by either of the two of its factions. That is, it is the voter constituency of the incumbent party that is placed front and centre and is thought to be driving the intra-party bargaining taking place inside it.

The party B, the two factions of the party A and the voters have transitive preferences described as ideal points on a Euclidian one-dimensional scale representing the policy space, for which the Nash equilibria are known to always exist (Tsebelis 2002, 20). The Conservative faction and the conservative voters of the V_C type have C as their ideal point. The Reformist faction and the reformist voters of the

V_R type have R as their ideal point. B is the ideal point of the opposition party B and its loyal voters. The absolute values of the distances on the scale, presented in Figure 1, reflect the utility gains and losses of the actors for the situations, in which they are forced to tolerate a winning point other than their ideal points. That is, the ranking of the preferences of each actor depends on the length of the distances, x and y , such that $x, y \in \mathbb{N}^*$. If $y > x$ (which is the case illustrated in the Figure 1), V_R and the Reformist faction's preference ranking is $R > C > B$. If $y < x$, it is $R > B > C$. x and y are assumed to take only the values that are non-negative integers. The information that is available to the actors regarding the locations of each other's ideal points on the policy scale is common for all of them, and this model examines only the situation where R is positioned between C and B . The complications that arise from the particular locations of the ideal point R on the scale between C and B are tackled further on in the course of this Chapter.

Figure 1. The spatial model of the policy space with $x < y$.



Note: C is the Conservative's ideal point, R is the Reformist's ideal point, B is the ideal point of the opposition party and its voters, x is the distance between C and R , and y is the distance between R and B .

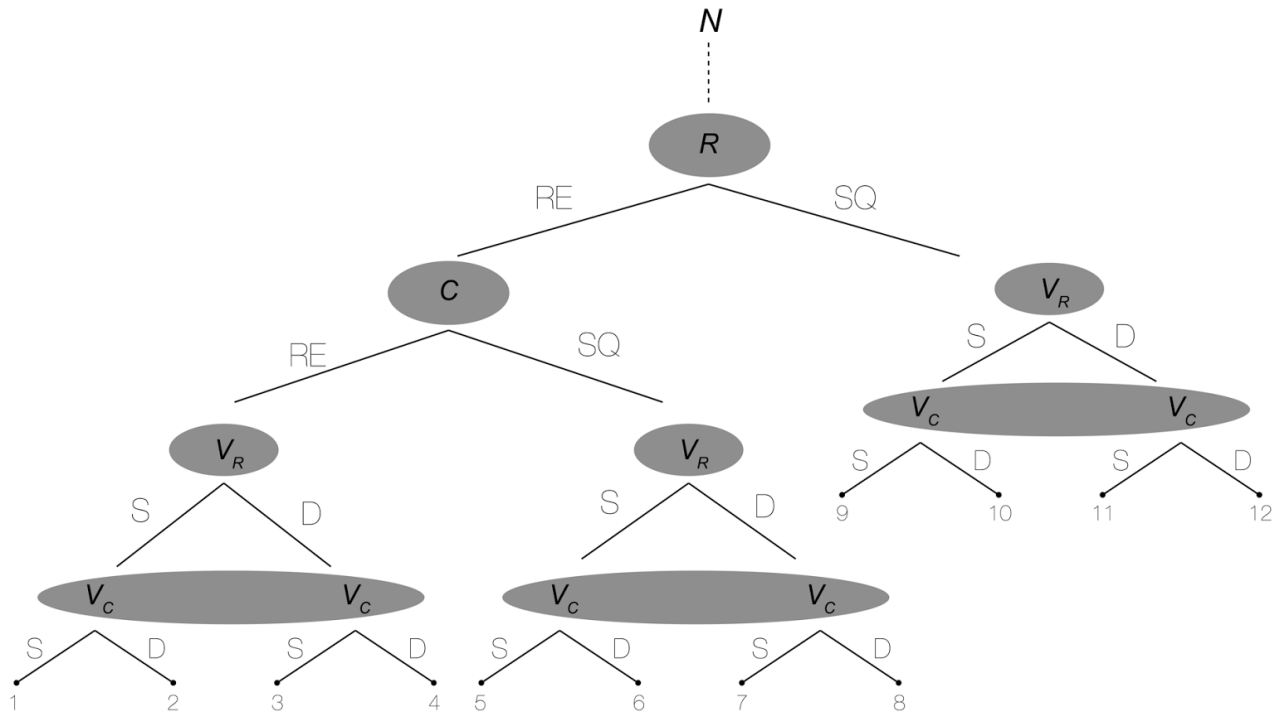
The party A's electorate, $K \in \mathbb{N}^*$, is divided into the voters who prefer R to C , V_R , and the voters who like C better than R , V_C . One of the two types of voters accounts for the majority of the party A's supporters at the start of the electoral cycle. The prevalence of either of the voter types in K is determined randomly before the intra-party bargaining process begins: V_R is set as the majority voter type of N with the probability $p \in [0, 1]$ while V_C becomes the majority type with the probability $1 - p$. The number of voters is assumed to be uneven in the total electorate, $E \in \mathbb{N}^*$, as well as in K , so that there is always a winner with a clear majority of $50\% + 1$ vote in the election.

The decision tree is presented in its extensive form in Figure 2. The ellipses situated around the names of the actors indicate the information sets, which appear due to the imperfect knowledge concerning the exact electoral conditions that is available to the voters and the factions. The factions have to set the party's official policy before the election. Either the Reformist or the Conservative faction must abandon its position for the ideal point of the rival faction to attain unanimity - otherwise C remains as the party's official policy point. The breakup of the party is considered impossible, as it is less likely to occur under restrictive electoral rules of the two-party system setting (Ceron 2012, 188). Once the Nature, N , determines the probabilistic properties of the electoral uncertainty, the Reformist faction initiates the sequence of strategic moves by either choosing to propose the policy change (RE) or to refrain from doing that and defend the current - or the status quo - policy of the party A instead (SQ). The Conservative faction will have to respond to the Reformist faction's reform proposal by selecting either RE to support the proposal, or SQ to protect the status quo policy. The Conservative faction does not have a possibility to respond if a policy proposal has not been submitted by the Reformist faction. The uncertainty as to whether the randomly determined majority of K is of the V_R or the V_C type affects the decision-making process of both voters and the factions of the party A. It is assumed that the information, on which the actors' beliefs regarding the probabilities of certain states of the world are based, is acquired from the same source and is identical for the voters and the factions alike. In addition, the sizes of the minority and majority groups in K are the major cause of concern for the actors, since this uncertain factor might turn out to have unforeseen consequences when the electoral results come in. Once the outcome of intra-party bargaining - the official party policy taken to the election, - is announced, the voters decide whether to support the party again (S) or defect to the party B (D). V_R and V_C make their decisions simultaneously and do not observe each other's decision-making. This is indicated by the information sets placed around their decision nodes. The non-voting strategy is excluded from the voters' strategy sets (that is, a combination of choices available to them: Aliprantis and Chakrabarti 2000, 58) in order to minimise the complexity of the model and shall be addressed in future improvements to the model.

The voters' cost of voting is assumed to be balanced out by the utility of not bearing the cost of social pressure (Gerber, Green and Larimer 2008). The cost of supporting party A when the internal policy-setting outcome has not been unanimous is also thought to be absent from their calculus. The voters are assumed to have complete information only on the final outcome of the intra-party

bargaining: the policy-setting process is understood to be perfectly non-transparent. The voters and the factions are assumed to be motivated by their policy ideal points, which leads them to experience utility gains from reaching their ideal point on the scale and utility losses from moving farther away from it. Thus, the goal of the factions is to adopt a party policy that satisfies their own policy preferences as well as the preferences of their voters in K . The factions and the voters who helped their party win gain maximum utility only from seeing their preferred policy - be it C or R - implemented and lose utility from tolerating a winning policy point that fails to match their ideal points. All actors seek to maximise their expected utility by choosing the most beneficial strategy.

Figure 2. The extensive form game of intra-party bargaining between the factions and the voters of the party A.



Note: R and C indicate the Reformist faction and the Conservative faction's decision nodes (Dixit and Skeath 2004, 46) respectively. The terminal nodes of the decision tree are numbered 1 through 12 and are referred to by their numbers throughout the Chapter.

With all essential and simplifying assumptions of the model set out above, it is now necessary to write down the utility equations (or payoffs) of the actors for all 12 outcomes that can be produced in the course of the game. The core logic that informs the structures of the payoffs that are laid out in the

following section stems from the probabilistic determination by the Nature: that is, 1) the majority of voters in K prefers R to C and 2) the majority of voters in K prefers C to R .

3.2. The payoffs.

The discussion of the model setting from the previous section suggests that choice of either ‘support’ or ‘defect’ strategy by the voters belonging to the majority type (set by the Nature to be either V_R or V_C with probabilities p and $1 - p$ respectively) should result in remarkably different outcomes for each of the four players in the game, as the deliberation products of the majority-type voters are decisive with regard to the winner of the election. However, the cases where the players encounter additional uncertainty besides not knowing which type of voters is the majority type are the ones where the minority-type voter selects the defection strategy. It is thus imperative for the party A to satisfy the following condition if it is to emerge victorious:

$$K - K_{V_C} > E/2,$$

where K_{V_C} is the number of the minority-type (V_C) voters in K when V_R is the majority type. That is, the number of party A supporters has to remain greater than one half of the total electorate in case the minority-type voters choose to defect to the opposition party. In the second hypothetical situation, the condition

$$K - K_{V_R} > E/2$$

has to be true, where K_{V_R} is the number of voters who belong to the minority voter type, V_R when V_C is the majority type in the party A’s voter base. The implications of this condition are similar to those of the first one. The description of the payoffs that all actors stand to receive in each of the 12 possible outcomes from the decision tree in Figure 2 is given below. The reverse order, in which the equations are listed (starting with the payoff of the last player to make a move and ending with the first player), is warranted by the analysis of the next section.

3.2.1. Terminal node 1: RE-RE-S-S.

First, it is necessary to consider the case where both factions sequentially selected RE over SQ (the node marked as 1 in Figure 2). The outcome in question is that of the party A winning the election with a reformed official policy and the support of K of its voters. This is also a unique case, as none of the rest of the hypothetical strategic sequences lead to a unanimously adopted policy reform being

approved by the totality of the party A's electorate. Where the strategy RE has been unanimously chosen by the party A, and V_R has chosen S over D, supporting the party A will give V_C the following expected utility:

$$EU_{V_C} = p(v - x) + (1 - p)(v - x),$$

where v is the maximum amount of utility an actor gains, when the winning policy point coincides with their own ideal point. The first part of the sum represents V_C 's utility of selecting S over D if V_R is the majority type of voters in K with probability p , while the second part reflects V_C 's utility of doing so when its type is the majority type of voters in K with probability $1 - p$. The expected utility equation above can then be reduced to

$$EU_{V_C} = v - x.$$

It demonstrates that a conservative-type voter stands to gain exactly the same utility regardless of the distribution of voters in K by type that was predetermined by the Nature and will always incur the loss of utility from tolerating the winning point that is x points farther than their ideal point on the scale. Upon reaching the terminal node 1, the voter of V_R type is left with

$$EU_{V_R} = pv + (1 - p)v,$$

which is simplified to

$$EU_{V_R} = v.$$

This payoff structure reflects the fact that V_R 's utility gain at the terminal node 1 corresponds to its maximum value possible, as the game is completed with R as its winning policy point. The payoffs of the factions are similar to those of the voters and can be described as

$$EU_{Cre} = v - x$$

and

$$EU_{Rre} = v$$

in their reduced form. The interpretation of the equations is identical to that of the voters' payoffs by type. The subscript 're' specifies that the equation has resulted from the choice of RE by the faction.

3.2.2. Terminal node 2: RE-RE-S-D.

This outcome is a hypothetical situation, in which the conservative segment of the party A's voter base, K_{V_C} , moves to reject the unanimously adopted policy reform, that is also backed by the reformist

voters. Choosing D over S after strategies RE-RE-S were selected by the other three actors will yield the expected utility of the following structure to the conservative-type voters:

$$EU_{V_C} = p(q_1(v - x) + (1 - q_1)(v - x - y)) + (1 - p)(v - x - y),$$

where $q_1 \in [0, 1]$ is the probability that $K - K_{V_C} > E/2$. The first half of the right-hand side of the equation reflects the need for V_C to consider the danger of being a decisive minority-type voter. The reason why V_C does not have to consider q_1 on the second half of the right side of the equation is intuitive: notwithstanding the similarity to the payoffs for the same strategic outcome when V_R is the majority type, with $1 - p$ the move by V_C to defect to the opposition party will instantly deprive the party A of its majority support in the electorate. The defection of the majority-type voters always hands the victory to the party B, as demonstrated by the V_C 's loss of both x and y due to its defection being pivotal. For the reformist-type voters, the sequence of RE-RE-S-D yields

$$EU_{V_R} = p(q_1 v + (1 - q_1)(v - y)) + (1 - p)(v - y),$$

which differs from V_C 's choice on the amount of utility loss sustained by V_R in case of the party B's loss. It should be equal to just y , and the success in the gamble grants V_R the maximum utility gain possible. The composition of factionalist payoffs is modelled with the same considerations in mind. The Conservative faction is set to gain

$$EU_{Cre} = p(q_1(v - x) + (1 - q_1)(v - x - y)) + (1 - p)(v - x - y),$$

while the Reformist faction should end up with

$$EU_{Rre} = p(q_1 v + (1 - q_1)(v - y)) + (1 - p)(v - y).$$

3.2.3. Terminal node 3: RE-RE-D-S.

Under this terminal node, the unanimous and publicly announced reformed official policy of the party A is rejected by the reformist-type voters and is supported by the rest of its electoral base. However unlikely this situation may seem, the methodological requirement for the extensive form game theoretical analysis is that the expected utility equations have to be outlined for all actors for each hypothetical alternative outcome - if only for the sake of posterity. When V_R selects D in Case A and V_C chooses S, the expected utilities of V_C and V_R are formulated in the following fashion:

$$EU_{V_R} = p(v - y) + (1 - p)(q_2 v + (1 - q_2)(v - y))$$

and

$$EU_{V_C} = p(v - x - y) + (1 - p)(q_2(v - x) + (1 - q_2)(v - x - y)),$$

where $q_2 \in [0, 1]$ is the probability that $K - K_{V_R} > E/2$. Thus, the actors have to take notice of the risk associated with the potential defection of V_R , whether they are a majority- or a minority-type voters. If the voters from this group do indeed resort to defection, all players stand to lose utility, with the Conservative faction and voters of the same type being forced to move all the way from C to B . The Conservative and Reformist factions will have to calculate

$$EU_{Cre} = p(v - x - y) + (1 - p)(q_2(v - x) + (1 - q_2)(v - x - y))$$

and

$$EU_{Rre} = p(v - y) + (1 - p)(q_2v + (1 - q_2)(v - y))$$

respectively in order to assess their utility gains and losses correctly for this outcome.

3.2.4. Terminal node 4: RE-RE-D-D.

In this case, the official policy proposed by the party is a new one, yet the electorate moves to unanimously reject it in favour of the opposition party's policy. The simultaneous choice of D by the voters of both types should lead V_C to obtain

$$EU_{V_C} = p(v - x - y) + (1 - p)(v - x - y)$$

simplified as

$$EU_{V_C} = v - x - y,$$

while V_R is certain to receive

$$EU_{V_R} = p(v - y) + (1 - p)(v - y)$$

or

$$EU_{V_R} = v - y.$$

The interpretation of these payoffs is uncontroversial: the players will have to sustain significant losses, as the winning point, B , is not the ideal point of any of them. The Reformist faction and voters are however less seriously affected by this outcome. The factionalist payoffs are

$$EU_{Cre} = v - x - y$$

and

$$EU_{Rre} = v - y.$$

The remaining cases can be described in pairs, the main reason being that the expected utility equations of the actors are formulated in precisely the same manner for the pairs of nodes 5 and 9, 6 and 10, 7 and 11 and, lastly, 8 and 12. This is made possible by the intra-party decision-making result, which is to put the status quo party policy to the electoral test for each of these nodes.

3.2.5. Terminal nodes 5 and 9: RE-SQ-S-S and SQ-S-S.

In the terminal node 5, the factions have selected RE and SQ correspondingly, leaving the old official policy in place due to the lack of the unanimous decision to reform it. In the terminal node 9, the choice of the Reformist faction was to avoid proposing the policy reform, which means that the status quo policy has been preserved without any opposition from the Conservative faction. The prior assumption was that the voters do not suffer any utility losses from voting for a party divided by internal conflict. Taking account of the fact that the outcome of the bargaining is identical for the two nodes, it is clear that the utility equations and the subsequent analysis should not be different depending on the node. If V_R chooses S over D, V_C 's choice of S will result in:

$$EU_{V_C} = pv + (1 - p)v$$

or

$$EU_{V_C} = v.$$

This is the exact opposite of the outcome in the terminal node 1, as it is the conservative-type voters that are gaining the maximum utility thanks to their ideal point matching the winning point, while the reformist-type voters are forced to accept an unfavourable policy. For V_R the resulting expected utility will be

$$EU_{V_R} = p(v - x) + (1 - p)(v - x)$$

or

$$EU_{V_R} = v - x.$$

Likewise, the Reformist and Conservative factions will get

$$EU_{Csq} = v$$

and

$$EU_{Rre} = v - x,$$

where the 'sq' subscript corresponds to the SQ strategy chosen by the faction.

3.2.6. Terminal nodes 6 and 10: RE-SQ-S-D and SQ-S-D.

Here, the defection of V_C is clearly counterintuitive. Yet the analysis has to include the utility equations for these two outcomes as well. Should V_C select D over S instead of following V_R 's suit, the voters' payoffs will be:

$$EU_{V_C} = p(q_1v + (1 - q_1)(v - x - y)) + (1 - p)(v - x - y)$$

and

$$EU_{V_R} = p(q_1(v - x) + (1 - q_1)(v - y)) + (1 - p)(v - y).$$

The defection strategy would put V_C 's own benefit in severe jeopardy, while certainly causing a great deal of pain to the Conservative faction and possibly to the Reformist faction and their supporters. The utility of these outcomes for the factions can be expressed as

$$EU_{Csq} = p(q_1v + (1 - q_1)(v - x - y)) + (1 - p)(v - x - y)$$

and

$$EU_{Rsq} = p(q_1(v - x) + (1 - q_1)(v - y)) + (1 - p)(v - y).$$

3.2.7. Terminal nodes 7 and 11: RE-SQ-D-S and SQ-D-S.

These two outcomes can reasonably be expected, as V_R is likely to be unhappy about the preservation of the status quo policy by the party and could choose to punish it by defecting to the party B. If V_R indeed chooses D over S, the payoffs to be awarded given V_C 's choice of S will be:

$$EU_{V_C} = p(v - x - y) + (1 - p)(q_2v + (1 - q_2)(v - x - y))$$

and

$$EU_{V_R} = p(v - y) + (1 - p)(q_2(v - x) + (1 - q_2)(v - y)).$$

Given the relative realism of this hypothetical result, the considerable risk is potentially borne by the players (especially by the Conservative faction and V_C). The factions will receive

$$EU_{Csq} = p(v - x - y) + (1 - p)(q_2v + (1 - q_2)(v - x - y))$$

and

$$EU_{Rsq} = p(v - y) + (1 - p)(q_2(v - x) + (1 - q_2)(v - y)).$$

3.2.8. Terminal nodes 8 and 12: RE-SQ-D-D and SQ-D-D.

Finally, if the voters of both types decide to defect to the party B in any of these two cases, their expected utilities are defined by the following equations:

$$EU_{V_C} = p(v - x - y) + (1 - p)(v - x - y) = v - x - y$$

and

$$EU_{V_R} = p(v - y) + (1 - p)(v - y) = v - y.$$

For the factions, this would result in the following distribution of payoffs:

$$EU_{Csq} = v - x - y$$

and

$$EU_{RsQ} = v - y.$$

3.3. The backward induction.

Backward induction, the core analytical technique that is utilised here to deliver a solution to the model, prescribes that the strategies of all players be considered starting with the comparison of the last actor's strategic choices and then proceeding upwards with the comparison of the preceding actors' strategies given the choices found optimal for the succeeding actors. Whenever a constraint is born out of the comparison, it should be introduced to the assessment of the complete strategy profile for the outcome in focus. If in a hypothetical case the expected outcome of a particular strategic choice of the actor is such that there exists a better alternative which can be chosen instead, the actor will always prefer the more beneficial strategy. In cases where several alternatives can be considered optimal depending on a specific constraint applied, the multiple optimal strategies are permitted. The subgame perfect Nash equilibrium (SPNE) is discovered, when the sequence beginning at the root of the tree and ending at the terminal node is found to consist of strategies that are optimal for every player with a choice in the sequence. Due to the presence of imperfect information, all actors have to completely exhaust the list of comparisons that stems from the decision tree.

It has to be noted that this section comprises only the cases that are bound by the context of total uncertainty, where the probabilities p , q_1 and q_2 never assume the extreme values of 0 and 1: $p, q_1, q_2 \in (0, 1)$. This restriction is quite intuitive in the sense that information on the preferences of

electorates is generally known to be imperfect in the real world, and the forecasts that entertain the certainty of an imminent and landslide victory by a political party cannot be wholeheartedly confirmed until the official vote count figures are finalised and released to the public. A further restriction has to be made on the policy preferences by ignoring the situation where $x = y$. This would likely lead to the disappearance of equality signs and limit the number of equilibria in the game to few constrained strategy profiles. The equidistance of R from other points on the scale, as well as the equality element in the condition which contains x and y and probabilities at the same time, constitute a special case of indifference between two of the remaining outcomes in the decision-making attitudes of the actors. The equidistance can be set aside in order to concentrate the analytical effort on the more pronounced cases, especially granted that it would be difficult to come up with an example of factionalist policy preferences positioned in such fashion, as it would likely cause confusion and ambivalence in the party's electorate and the perhaps inside the party itself. I have also conducted the analysis under the original broad assumption about the probabilities and kept the equality signs: the full list of equilibria that were found to exist is reported in the Appendix 1 to this thesis.

3.3.1. The conservative voter, V_C .

The backward induction begins with the assessment of choices of the conservative-type voter. The comparison is to be made between the V_C 's strategies for the following pairs of terminal nodes: 1 and 2, 3 and 4, 5 (9) and 6 (10), and 7 (11) and 8 (12). The comparisons for the last two pairs of nodes will be presented jointly with those for the preceding two pairs due to the payoffs being identical. If V_C is to prefer S to D, their utility in the terminal node 1 has to exceed that in the terminal node 2:

$$v - x \geq p(q_1(v - x) + (1 - q_1)(v - x - y)) + (1 - p)(v - x - y).$$

The simplification of this inequality yields

$$y(1 - pq_1) > 0,$$

which always holds as each of the variables can only be positive numbers. Thus, V_C strictly prefers S to D when faced with a choice between the outcomes 1 and 2. For the pair of outcomes 3 and 4, the conservative voter will have to consider

$$p(v - x - y) + (1 - p)(q_2(v - x) + (1 - q_2)(v - x - y)) \geq v - x - y$$

for it to benefit from S more than from D. This inequality in its reduced form can be transformed into

$$yq_2(1 - p) > 0.$$

This constraint can be interpreted as restricting V_C 's optimal options to S. In the comparison of 5 (9) and 6 (10), the conservative voter picks S over D if

$$v \geq p(q_1 v + (1 - q_1)(v - x - y)) + (1 - p)(v - x - y)$$

holds true. This is indeed the case, as follows from the simplification of the strictly correct inequality:

$$(x + y)(1 - pq_1) > 0.$$

As dictated by the assumptions of the model, V_C should always select S over D under this constraint. The last comparison that the conservative voter must consider is between 7 (11) and 8 (12). For S to be preferred over D, the inequality

$$p(v - x - y) + (1 - p)(q_2 v + (1 - q_2)(v - x - y)) \geq v - x - y$$

must be satisfied. By simplifying this I find

$$q_2(x + y)(1 - p) > 0,$$

which is never violated under the assumptions of the model and means that V_C strictly favours their strategy S over D. At this point it is safe to say that the strategic profiles resulting in those outcomes that are marked with even numbers on the decision tree - namely, 2, 4, 6, 8, 10 and 12, - will never be the SPNE of the game, as V_C is always keen enough to avoid them by choosing S over D. The summary of constraints is given in Table 1.

Table 1. The summary of the conservative voter's comparisons.

The outcome pair compared	The optimal strategy	The constraint
1 and 2	S	none
3 and 4	S	none
5 (9) and 6 (10)	S	none
7 (11) and 8 (12)	S	none

3.3.2. The reformist voter, V_R .

The next actor that should be examined for optimal strategic behaviour is V_R , whose turn to decide arrives immediately before V_C 's, as shown on the tree in Figure 2. The outcomes 1 and 3, as well as 5 (9) and 7 (11) have to be scrutinised pairwise in order to disclose the optimal strategies of the reformist voter. The first inequality to regard is

$$v \geq p(v - y) + (1 - p)(q_2 v + (1 - q_2)(v - y)).$$

It describes the situation when choosing S over D is optimal for the player and can be reformulated as

$$y(1 - q_2 + pq_2) > 0,$$

a strict constraint that makes it imperative for V_R to select S. The remaining comparison can be written as the following, if V_R is to prefer S to D:

$$v - x \geq p(v - y) + (1 - p)(q_2(v - x) + (1 - q_2)(v - y)),$$

which, under the prior assumptions made about probabilities, is reduced to

$$x < y.$$

In this case, the constraint is weak due to the possibility that $x - y > 0$, and it can be rewritten as

$$x > y,$$

which induces the reformist voter to be either indifferent between S and D when the equality sign replaces the inequality sign, or prefer D to S. The summary of the V_R 's decision-making is provided in Table 2.

Table 2. The summary of the reformist voter's comparisons.

The outcome pair compared	The optimal strategy	The constraint
1 and 3	S	none
5 (9) and 7 (11)	S	$x < y$
	D	$x > y$

3.3.3. The Conservative faction.

For the Conservative faction the pairs of outcomes, for which their expected utilities have to be juxtaposed, are located on the left-hand side of the decision tree. The pairs of terminal nodes in focus are 1 and 5 (9), and 1 and 7 (11). For the first pair of outcomes to be assessed robustly, the Conservative faction has to take notice of the $x < y$ constraint that binds the optimality of the outcome 5 for the reformist voter. The actor prefers RE to SQ if

$$v - x \geq v,$$

or

$$x \leq 0,$$

which is never true. That is, the Conservative faction will always find the SQ strategy optimal and will likewise be satisfied with the outcome 9, even though they do not have an opportunity to directly influence it. The second comparison takes into account the $x > y$ constraint from the analysis of V_R 's

strategizing and implies the following inequality must hold true for the Conservative faction to choose RE over SQ:

$$v - x \geq p(v - x - y) + (1 - p)(q_2 v + (1 - q_2)(v - x - y)),$$

which can be simplified to

$$q_2(1 - p) \leq \frac{y}{x+y}.$$

This is clearly a weak constraint that can be presented as

$$q_2(1 - p) \geq \frac{y}{x+y}$$

for SQ to be either equally beneficial or a better choice than RE in the eyes of the Conservative faction. The summary of the actor's strategies with constraints can be found in Table 3.

Table 3. The summary of the Conservative faction's comparisons.

The outcome pair compared	The optimal strategy	The constraints
1 and 5 (9)	SQ	$x < y$
1 and 7 (11)	RE	$x > y; q_2(1 - p) \leq \frac{y}{x+y}$
	SQ	$x > y; q_2(1 - p) \geq \frac{y}{x+y}$

3.3.4. The Reformist faction.

The interpretation of the outcome 1 is definitive, as the Reformist faction stands to secure the maximum utility gain possible by selecting RE if the constraints, under which the Conservative faction chooses RE and the party's voters choose S unanimously ($x > y$ and $q_2(1 - p) \leq \frac{y}{x+y}$), hold. Therefore, the first SPNE of the game can be written as (RE, RE, S, S) given the constraints. The first faction to make a move has to carefully consider the difference between its expected utility of the following pairs of outcomes: 5 and 9, as well as 7 and 11. For the former pair, the inequality can be written as

$$v - x \geq v - x,$$

which is always a strict equality. The Reformist faction will select either RE or SQ, if this is the case with the $x < y$ constraint. The strategy profiles (RE, SQ, S, S) and (SQ, S, S) can thus be considered to be the subgame perfect Nash equilibria of the game. The comparison of the latter pair of outcomes for the Reformist faction leads to

$$p(v - y) + (1 - p)(q_2(v - x) + (1 - q_2)(v - y)) = p(v - y) + (1 - p)(q_2(v - x) + (1 - q_2)(v - y)),$$

confirming that (RE, SQ, D, S) and (SQ, D, S) are the SPNE of the game when $x > y$ and $q_2(1 - p) \geq \frac{y}{x+y}$ are true. Table 4 compiles the findings I obtained from performing the backward induction on the model by listing the equilibria with constraints.

Table 4. The list of equilibria with constraints.

SPNE	The constraints
(1) (RE, RE, S, S)	$x > y; q_2(1 - p) \leq \frac{y}{x + y}$
(2) (RE, SQ, S, S)	$x < y$
(3) (RE, SQ, D, S)	$x > y; q_2(1 - p) \geq \frac{y}{x + y}$
(4) (SQ, S, S)	$x < y$
(5) (SQ, D, S)	$x > y; q_2(1 - p) \geq \frac{y}{x + y}$

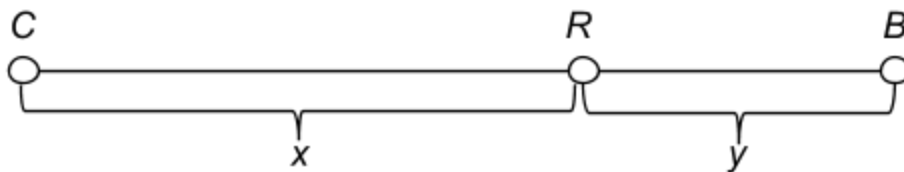
3.4. Discussion and hypotheses.

What can be instantly inferred from the results of the backward induction presented in Table 4? One important general observation is that even with the stringent boundaries imposed on probabilities and policy distance variables there exist equilibria which share the same constraint. This result in essence implies that while the solution to the model narrows down the number of possible strategy profiles, the cases where the Reformist faction and other actors appear to exhibit indifference to the strategic alternatives they have at their disposal have not been entirely eliminated. What strikes me the most is that in several equilibria this indifference is tied to the certainty of information on some of the probability values available to the actors. One possible explanation is that the model performs well with respect to predicting all possible patterns of behaviour of the actors, while failing to determine unique and exclusive equilibria. The factions and the voters of course were found to act in a certain way under fairly explicit conditions. However, none of the equilibria, with a notable exception of the first one, are manifested as singular, which implies that the players might actually end up taking another equilibrium path given the availability of other options.

3.4.1. The general characterisation of the equilibria.

Despite the fact that the five equilibria set out in Table 4 at first glance might seem to paint an inconclusive and vague picture of intra-party bargaining and voting with multiple equilibria existing simultaneously, a number of clear testable propositions starts to emerge upon a closer examination. First, the pair of equilibria (2) and (4) are clearly different from the (1), (3) and (5). These two groups of equilibria are in fact mutually exclusive, as the former exists under the $x < y$ constraint that eliminates the chance of the latter to produce optimal strategic profiles for the game. To put more simply and relate this finding to the policy space I modelled in the section 3.1 of this Chapter, the location of R closer to C on the scale than to the ideal point of the opposition party B has an extraordinary impact on the behaviour of the rational actors of the game in terms of restricting the menu of strategies for the Conservative faction and the voters of both types to just one. Under (2) and (4) all of the three actors I named will have to defend the status quo policy of the party in order to maximise their expected utilities of the corresponding outcomes. While the Reformist faction nominally is indifferent between its strategies RE and SQ, their actual choice obviously will have no bearing on the subsequent rollout of strategies by other actors. The other direct implication of (2) and (4) is that all actors are expected to weigh only the policy distance difference while making their decisions: factions and voters alike are supposed to disregard the electoral uncertainty in their calculations, as the closeness of R to C is imperative.

Figure 3. The spatial model of the policy space with $x > y$.



Note: C is the Conservative's ideal point, R is the Reformist's ideal point, B is the ideal point of the opposition party and its voters, x is the distance between C and R , and y is the distance between R and B .

The higher level of complexity is introduced to the game once R becomes positioned in closer proximity to B than to C , which results in the policy distance condition being shifted to $x > y$. Figure 3

illustrates the case. (2) and (4) are automatically removed from the vocabulary of the actors and are replaced by (1), (3) and (5). Depending on the specific values that probabilities p and q_2 and the policy distance variables x and y assume, the assortment of simultaneously possible equilibria may change. For instance, if the second constraint of the three strategic profiles is written as an equality $q_2(1 - p) = \frac{y}{x+y}$, all three are allowed on the list of options contemplated by the actors at their respective stages of the game. With a 10-point policy scale where C is 1 and B is 10, the term on the right-hand side of the equation can be equal to approximately 0.44. Such a setting would naturally require a good balance to be present between the values of the two parts of the left-hand side term, where neither is allowed to be greater than 0.65. This is definitely a fragile solution, which lends support to the argument that the indifference of the actors between the three possible equilibria in this case arises from the reasonably high risks they associate with the electoral outcome and the difficulty of drawing a meaningful comparison between the combined risk and the policy distance difference. Let us continue with the same numeric example. Where the right-hand side constraint is $q_2(1 - p) < \frac{y}{x+y}$, (1) is a unique equilibrium. This is an extraordinary result, as the intra-party policy reform that the lessons from the real-life politics made so painfully clear cannot be accomplished with ease and does not surface as a frequent outcome of factionalist interaction indeed should be a problematic and rare occurrence. The lower the multiplication term composed of the probabilities is and the closer R in the example to the middle of the road between C and B , the higher the likelihood of (1). In other words, even with a close-to-the-middle R at least one of the probabilities should be negligible for the players to end up with this strategic profile. $q_2(1 - p) > \frac{y}{x+y}$ restricts the variety of choice of the actors to (3) and (5), where the greater value of the left-hand side probabilistic term and the lower right-hand side policy distance-based term should yield the imminent defection of the reformist-minded voters provoked by the certain failure of the party A's factions to adopt a reform proposal - if it was on the table at all. Quite intuitively, the Conservative faction under (3) and (5) is highly likely to take the risk and oppose the policy reform. This makes the type of utility functions of the factions an interesting point to explore in connection with the model: as there is no consensus in the literature as to whether the politicians are keen to avoid the risk, are neutral to it as assumed here, or are daring (Morton 1999, 38), the propensity of the Conservative faction to oppose policy change in such uncertain conditions could be dramatically different under an alternative assumption. The last observation that I feel obliged to emphasise is that q_2 in particular is a very uncertain probabilistic variable that partially is a function of p . Hence, the

actors should be ready to seek appropriate information to estimate its value: one can imagine that in the real life the politicians in factions and the voters will have to rely on a combination of opinion polling and expert analysis in that regard. Table 5 contains the summary of the predicted outcomes with their determinants based on the interpretation of the equilibria.

There are practical implications for the theory of intra-party bargaining that the model gives rise to. For instance, the equilibria demonstrate that the factions might be eager to use position-taking as a means to force their preferred policy agenda through when their size and influence is equal or relatively similar. This is especially consequential for the Reformist faction, which will likely seek to obtain precise information on the electoral mood to determine whether it can place itself closer to the opposition party in the policy space and issue threats to the Conservative faction by arguing using the probabilistic evidence that the number of defecting voters can be potentially devastating if the policy is not reformed. In the two-party setting of the model, which the Duverger's law (1954) permits under the one-round multi-district elections with plurality rule, there are simply no third parties positioned to the left of the Conservative faction, making it difficult for them to resist such a policy proposal where the available information points to the higher likelihood of desertion by voters if the status quo is preserved. However, this kind of danger does not arise often, which may explain why some political parties in two-party systems manage to successfully hold onto power for several electoral cycles in a row with only slightly decreasing share of voter support.

Table 5. The summary of outcomes with the determinants of behavioural change.

Outcomes	Determinants
SQ, Party A victory with certainty	$x < y$
RE, Party A victory with certainty	$x > y, \frac{y}{x+y} \uparrow, q_2(1-p) \downarrow$
SQ, uncertainty	$x > y, \frac{y}{x+y} \downarrow, q_2(1-p) \uparrow$

Note: the upward-looking arrow indicates that the increase in the corresponding term is required; the downward-looking arrow indicates the required reduction in the corresponding term; the lack of arrow indicates that such trend is irrelevant.

3.4.2. The testable hypotheses.

In the Chapter 2, I argued the case of a laboratory experiment as the most appropriate method of evaluating the predictions of a formal model that is characterised by a high degree of internal validity. Consequently, the observations I made in the present discussion about the optimal behaviour of factions and voters and the conditions, under which various intra-party policy decisions and electoral outcomes are predicted to come into existence, on the basis of the solutions discovered for the model of intra-party bargaining and voter response. It is inferred from the model that there are three variables that determine the strategic choices of the actors: a) the difference between policy distances x and y , b) p , the probability of Reformist being the majority type in the electorate and c) q_2 , the probability that the defection of the minority-type Reformist voters will not lead to the electoral victory of the opposition party B. Thus, it can be said that these three variables have causal impact on the key results of the game, the decision of the factions on the official party policy and the party that wins the election. To proceed with the empirical analysis at the maximum level of efficiency, a set of testable hypotheses has to be put forward for a subsequent experimental examination. The first hypothesis is derived from the equilibria (2) and (4) of the game and corresponds to the outcome where the factions of the party A decide to take the status quo policy to the election, which is then won by the party A.

Hypothesis 1: *where the ideal point of the Reformist faction and the voters of the Reformist type is situated closer to the ideal point of the Conservative faction and voters than to the ideal point of the opposition party B on the policy scale (that is, $x - y < 0$), the current official policy of the incumbent party A is preserved, and the party A wins the election.*

The second hypothesis reflects the equilibria (1), (3) and (5) is split into three parts. The first part deals with the situation where the factions choose to reform the official party policy, and their party eventually wins the election.

Hypothesis 2.1: *where the ideal point of the Reformist faction and the voters of the Reformist type is situated closer to the ideal point of the opposition party B than to the ideal point of the Conservative faction and voters on the policy scale (that is, $x - y > 0$), and the policy distance difference considerations outweigh the electoral uncertainty considerations in the actors' reasoning ($q_2(1 - p) < \frac{y}{x+y}$), the official policy of the incumbent party A is reformed, and the party A wins the election.*

The second part illustrates the outcome, in which the official party policy is not changed, and the voters of the Reformist type are expected to defect to the opposition party B and potentially help it to win the election.

Hypothesis 2.2: *where the ideal point of the Reformist faction and the voters of the Reformist type is situated closer to the ideal point of the opposition party B than to the ideal point of the Conservative faction and voters on the policy scale (that is, $x - y > 0$), and the electoral uncertainty considerations outweigh the policy distance difference considerations in the actors' reasoning ($q_2(1 - p) > \frac{y}{x+y}$), the current official policy of the incumbent party A is preserved, and either the party A or the party B wins the election.*

The equal possibility of equilibria (1), (3) and (5) is formulated in the third part of the second hypothesis.

Hypothesis 2.3: *where the ideal point of the Reformist faction and the voters of the Reformist type is situated closer to the ideal point of the opposition party B than to the ideal point of the Conservative faction and voters on the policy scale (that is, $x - y > 0$), and the electoral uncertainty considerations are equal to the policy distance difference considerations in the actors' reasoning ($q_2(1 - p) = \frac{y}{x+y}$), the official party policy can either be preserved or reformed, where the latter results in a victory of the party A, and the former results either in the victory of the party A or of the party B.*

Notwithstanding the complexity of the calculations and the simplistic abstraction of the policy space and the institutional arrangement of the model, the equilibria I discovered are clearly thought-provoking, realistic in many respects and provide sufficient material for the empirical testing presented in the Chapter 4. The model in its most basic and simple rational choice-influenced form has direct implications for the way the internal life of a political party is conceived of as well as for our understanding of the policy- and uncertainty-related deliberation that voters undertake. The hypotheses that underpin the empirical evaluation of the concluding chapter and are set forth in its first section are firmly anchored in the interpretation presented in this section.

Chapter 4. The laboratory experiment with intra-party bargaining and voting.

4.1. The experimental design and procedures.

The laboratory experiment⁷ presented in this Chapter is founded on the premises of the model from the Chapter 3 and is aimed at testing the outcomes identified in the discussion section of that Chapter. Naturally, the primary purpose of this experiment is the evaluation of the four hypotheses about the behaviour of factions and voters of the incumbent party A that I outlined in the concluding paragraphs of the discussion of the equilibria of the game. In other words, the aim is to examine the relationship predicted to bind the *independent (explanatory) variables* of the model, the policy distance difference (the difference between x and y) and the electoral uncertainty, and its *dependent (outcome) variables*, the official policy point of the party A chosen by the factions and the winning party of the election (party A or party B).

4.1.1. The context of the game and the treatments.

In order to prevent any emotional bias from arising and affecting the behaviour of participants in the course of the experiment, all charged references to politics and ideology were removed from the instructions and visual materials. The terms ‘conservative’ and ‘reformist’ were replaced with ‘black’ and ‘red’ in all instances of their use. Likewise, the incumbent and opposition parties in the experiment were referred to as the ‘party A’ and the ‘party B’, while the term ‘faction’ was substituted with the term ‘group leader’. A 10-point policy scale showing the locations of the ideal policy points of the group leaders and the voters of two types, Black and Red, the ideal point of the party B, the numerical equivalents of the distances x and y and the distance between Black and party B (which was set to be equal to 9 for all 12 rounds of the game) was displayed on a screen. The location of the Red point was changed twice during the session: first, after the practice round and then again, at the beginning of the round 7 to reflect the change of the policy distance difference treatment. In addition, each participant received a sheet of paper⁸ with the policy scale on it, which was replaced for rounds 7-12. A deck of playing cards containing 10 cards of Black and Red colours was utilised in the random assignment of

⁷ The laboratory experiment is self-funded and was conducted by the author of this thesis with the assistance of the first-year and second-year students at the Master’s Degree Programme in Public Choice, formerly known as MDP in Quantitative Social Research. The laboratory space was kindly provided by the University of Tampere with the help of professor Katri Sieberg. The four sessions took place on the week of 13.03-17.03.2017.

⁸ The Appendix 6 to this thesis contains the sample policy scale sheets that were used in the experiment.

voter types. The number of Red cards in the deck was written on the whiteboard and announced at the start of rounds 1, 4, 7 and 10. This number reflects the probability p of Reformist-type voters being a majority in the party A's electorate. The electoral uncertainty in the experiment is represented by the probability p , while q_2 is excluded from the treatment assigned to the participants. The main reason behind this omission is to simplify the analysis of the data gathered from the experiment. The measurement of treatment effects would be severely impeded if three independent variables were included in the design: Holt (2007, 20) notes that even with just two 'moving parts' establishing the causes of a change in observed behaviour could prove complicated. In addition, the exclusion of the second probability variable improves the ecological validity of the experimental setting by making it somewhat more realistic (Holbrook 2011, 149), as the actual voters especially - and, perhaps, the politicians as well - would likely find the complete deliberative procedures described in the model rather daunting. The other justification is the scarcity of funding, which made it virtually impossible for the duration of each session to be sufficiently long to permit the assignment of q_2 and recording of the information pertaining to it by the participants.

4.1.2. The order of treatment provision.

Two one-hour, 12-round sessions were organised, and four different treatment combinations were administered per session. The number of rounds chosen was motivated by the desire to increase the number of observations for the outcome variables for each session. First, the rounds 1 through 3 were played with the 'negative difference between x and y and $p = 0.4$ ' treatment combination. The 'negative difference between x and y and $p = 0.6$ ' treatment arrangement was provided during the rounds 4-6. The 'positive difference between x and y and $p = 0.4$ ' treatment followed for rounds 7-9. Rounds 10-12 of the 'positive difference between x and y and $p = 0.6$ ' treatment permutation concluded the session. These two sessions were conducted under the order I of treatment provision. The other two sessions mirrored the ones just described in all by the order of treatment provision. In the order II sessions, the last two treatments of the order I were activated during the first 6 rounds, while the first two treatments were moved to the second half of the session. In laboratory experiments, this design pattern is normally employed to control for potential order effects: the treatment effects discovered for the experiment have to hold regardless of the sequence, in which the treatments were offered to the participants (Battaglini, Morton and Palfrey 2010, 72; Sieberg et al 2013, 379). The choice of these two specific levels of the probability treatment is based on 1) the need to control for the effect that a lower or a higher probability

p might have on the outcomes suggested by the hypotheses, on 2) the necessity of recording whether such effect, if present, will hold even with probability levels located in close proximity to each other, and due to 3) the capacity to investigate a more diverse selection of probability levels being limited by the funding constraints.

4.1.3. The game setting and the random assignment of treatments.

The experiment is designed along the lines of the game theoretical model and replicates the strategic decision-making of its actors. Each session of the experiment was played with a group of 6 participants with an earnings practice and a practice round preceding the main body of the game. First, the participants were offered to select an instruction sheet⁹ they would keep throughout the session at random from a pack of 6 sheets. The participant number and role were written at the top of the front side of each sheet. That is, four participants were randomly assigned to play as the voters of the party A and two participants as either a Red or a Black group leader for the total duration of the session. The main part of the instructions describing the setting and the outline of the game was read out loud to all participants. Participants were informed that the voter players would be assigned either Red or Black as their preferred policy point at the beginning of each round. They were also told that the party B would always be supported by one hypothetical voter. Participants were then asked to familiarise themselves with the last paragraph, which differed depending on the role that they were assigned. Players were instructed to avoid all types of interaction with other participants and address their questions to the experimenter and the assistants at any time. Participants were asked to record the relevant information (the number of Red cards, the personal colour [voters only], the decision of the group leaders, the winning policy point and the personal earnings per round) in the appropriate row of the table on the reverse side of the instruction sheet. Next, each participant was given an earnings practice sheet¹⁰ and instructed to quickly solve a set of simple tasks aimed at ensuring that they understand the concept of policy points and are able to calculate their hypothetical earnings based on it. A practice round was played after the completion of the earnings exercise in order to let players experience the game in its entirety and resolve all remaining problems with the rules of the game.

⁹ Sample instruction sheets can be found in the Appendices 2, 3 and 4 of this thesis.

¹⁰ A sample earnings practice sheet is enclosed as the Appendix 5 to this study.

4.1.4. The outline of the game.

Just as the formal model of the Chapter 3 is constructed to analyse the strategies and outcomes of one isolated instance of intra-party policy setting and electoral response to such, each round of the experiment constitutes a single one-shot game, the outcomes of which have no direct bearing on the experimental procedures of the subsequent rounds. To enforce conformity of the experimental setting with this design feature, the group leader and the voter players were instructed to take into account solely the information that is relevant for the present round while weighing their options. At the start of the round, the voters were being randomly assigned into Red and Black types (i.e. Reformist- and Conservative-type voters), while the group leaders were setting the official party A policy. The policy-setting deliberation was completed ‘behind the closed doors’: the group leaders were either escorted out of the room or asked to join the experimenter to avoid being observed by the voters, which could in turn inadvertently lead voters to blame one of the group leaders for choosing a policy to their detriment¹¹. The Red group leader (in the model, the homogenous Reformist faction) made the first move by circling ‘Red’ to proposal a change of the current policy of the party (Black) or ‘Black’ to support the current policy instead on a sheet of paper provided to them. The Black group leader (that is, the Conservative faction) was then informed about the choice of the Red leader and offered to circle their preferred option (‘Red’ or ‘Black’) on a sheet of paper if the preceding choice was ‘Red’. The outcome policy point was then announced to the voters, who had to indicate their party of choice by circling ‘A’ or ‘B’ on a ballot paper¹². Finally, the ballots were collected, the votes were counted with the addition of one hypothetical vote cast for the party B, and the winning party and policy point were announced.

4.1.5. The research ethics and the monetary incentives.

This study conforms with the principles of handling personal data set forth in the Finnish Personal Data Act (Henkilötietolaki 523/1999)¹³ and with the ethical guidelines issued by the Finnish Advisory Board on Research Integrity (2002). The principles of the autonomy of research subjects, avoiding harm and

¹¹ I am grateful to Daniel Kalchev for suggesting this design feature as a means to reduce the emotional bias and increase the realism of the experimental context.

¹² The sample group leader sheets and ballot papers are included in the Appendix 7 of this study.

¹³ The English-language overview of the provisions of the Act from the website of the Finnish Social Science Data Archive was consulted.

protecting the privacy and confidentiality of the personal information lie at the core of this laboratory experiment. All participants were offered to place their signature on an informed consent form¹⁴ detailing the purpose of the experiment, their right to discontinue their participation in the experiment at any point in time, their right to privacy and the contact information of the experimenter. The anonymity of participants was ensured, and the personal information recorded in consent forms was properly coded and stored.

24 undergraduate students at the University of Tampere and the Tampere University of Technology were invited at random and recruited to participate in the experiment. Four 1-hour sessions were organised. Each participant was paid a €5 compensation in cash for attending the experiment immediately upon signing a consent form provided to them. At the end of each session, two participants were selected at random and paid their earnings of up to €10 in cash for a randomly picked round¹⁵. The hypothetical earnings for the round were calculated according to the following formula:

€10 - (the distance between the ideal point of the player (Red or Black) and the winning point on the policy scale).

The random selection of the first winner was performed by drawing a card from a 6-card deck, where the number of the card corresponded to the number of the winning participant; the second winner was chosen similarly, with the previously picked card removed without replacement. The determination of the winning round was performed once for each winning participant by drawing a card from a 12-card deck, with the number of the card corresponding to the number of the winning round.

4.2. The data analysis.

This section is organised in the following fashion: first, the data developed from the experimental materials is discussed; second, the descriptive statistics are placed in the spotlight; third, the treatment effects are considered; fourth, the order effects are examined; fifth and last, the logistic regression on the ‘Leaders’ Decision’ variable is presented.

¹⁴ The sample of the informed consent form used in the experiment is provided in the Appendix 8 to this thesis.

¹⁵ In other words, one participant could take from €6 to €15 home.

4.2.1. The experimental data.

The analysis of this Chapter takes advantage of the group-level data on the policy distance difference and probability treatment levels, the decisions of the group leaders and the winning party that was gauged in the experiment. In light of significant financial and time limitations, I decided against including the individual-level data in the investigation presented in the next subsection. In order to ensure that the participants are focused mainly on the decision-making outcomes and the calculation of their earnings by assessing the policy scale, they were not instructed to keep track of their individual strategic choices. The data input was carried out after the completion of the four experimental sessions on the basis of the information from the tables of results used by the participants. Each observation contains the information on the treatments and outcomes for one round of a given session. Thus, the total number of observations is 48. The data from practice rounds was not used in the analysis. The codebook for the data is provided in the Appendix 9 to this study.

4.2.2. The descriptive statistics.

I begin by presenting the descriptive statistics on the experimental data. Table 6 lists the frequencies and percentages of decisions made by group leader players in all four sessions.

Table 6. Leader's decision percentages and frequencies by treatment combination and winning party.

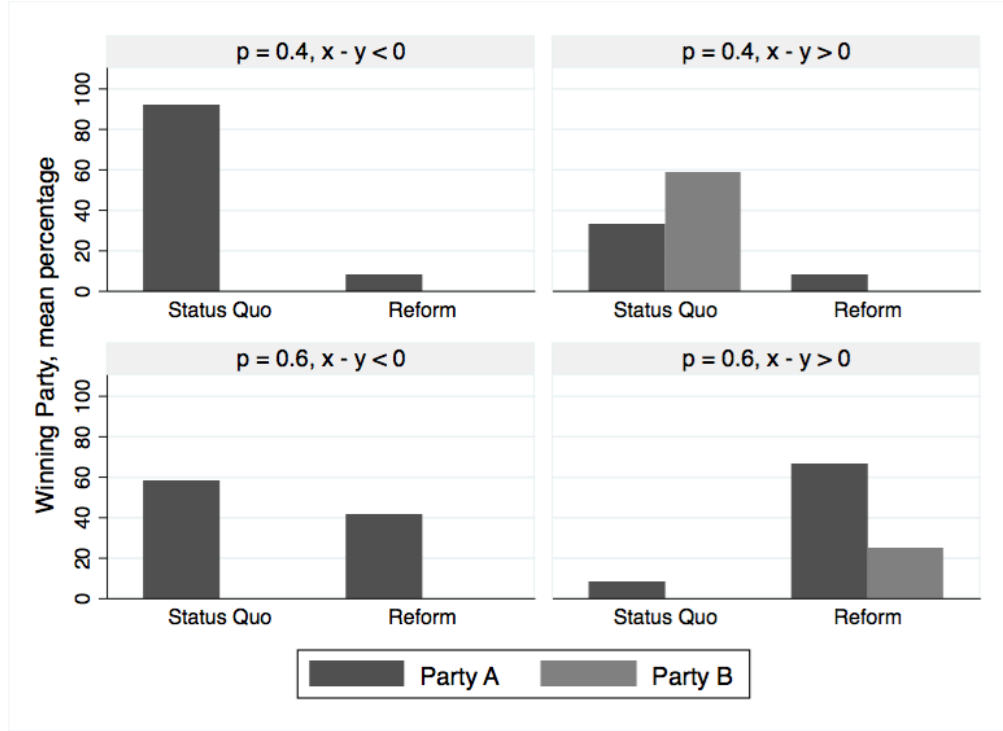
	Status quo			Reform			Total		
	Party A	Party B	Total	Party A	Party B	Total	Party A	Party B	Total
$p = 0.4, x - y < 0$	11 91.67 100.00	0 0.00 0.00	11 91.67 100.00	1 8.33 100.00	0 0.00 0.00	1 8.33 100.00	12 100.00	0 0.00	12 100.00
$p = 0.4, x - y > 0$	4 33.33 36.36	7 58.33 63.64	11 91.67 100.00	1 8.33 100.00	0 0.00 0.00	1 8.33 100.00	5 41.67	7 58.33	12 100.00
$p = 0.6, x - y < 0$	7 58.33 100.00	0 0.00 0.00	7 58.33 100.00	5 41.67 100.00	0 0.00 0.00	5 41.67 100.00	12 100.00	0 0.00	12 100.00
$p = 0.6, x - y > 0$	1 8.33 100.00	0 0.00 0.00	1 8.33 100.00	8 66.67 72.73	3 25.00 27.27	11 91.67 100.00	9 75.00	3 25.00	12 100.00

N (total = 48)

Note: each top row contains the individual category and cumulative frequencies, each middle row lists the individual category and cumulative percentages of the total per treatment combination, each bottom row gives the individual category and cumulative percentages per winning party.

One of the first contentious issues that I would like to point out is that the decision to take a reformed party policy to the election was made in the majority of 11 out of 12 (91%) of cases only under the ' $p = 0.6, x - y > 0$ ' treatment combination, while in the other three treatment combinations the status quo policy was the prevalent choice of the group leaders. The policy of the party A was also reformed in 41% (5 out of 12) of cases in the ' $p = 0.6, x - y < 0$ ' pair of treatments. These two pieces of information appear to indicate that while the positive policy distance difference has a higher prevalence of reformed policy, a $p = 0.6$ induces the group leaders to select Reform more frequently than the model implies. In fact, the Hypothesis 1 states that the intra-party bargaining under $x - y < 0$ should always result in the preservation of status quo policy, regardless of the value assumed by p . Figure 4, which represents the percentages of the voting outcomes sorted by the treatment combination and leaders' decision, gives a greater insight into the general picture of decision-making.

Figure 4. Winning party percentages by treatment combination and leaders' decision.



The bar charts in Figure 4 give a clear indication concerning the party-related outcomes. The party B emerges as the winner of the election only under the $x - y > 0$ treatment, and the majority of cases where this happened coincided with the choice of Status quo policy by the group leaders. This seems to be consistent with the Hypothesis 2.2, according to which the lower values of p contribute to the increased likelihood of Status quo policy being chosen by the leaders and rejected by the voters. The support for the Hypothesis 1 is quite strong, as there are no cases where the party B was chosen in the left-side half of the figure (i.e., under the $x - y < 0$ treatment). However, the fact that in slightly over 20% of cases under the ' $p = 0.6, x - y < 0$ ' arrangement at least a pivotal minority of voters opted for the party B after the leaders chose to reform the party A's policy is counterintuitive and contradicts the theory. In this case and under the logic of the Hypotheses 2.1-2.3, the party A should have secured the majority of votes. Still, the trend in the two right-hand charts generally matches the predictions of the Hypotheses 2.1-2.3, as the leaders' decision to reform their party's policy and the corresponding vote to elect the party A become more frequent under the higher level of p .

4.2.3. The treatment effects.

To confirm whether the treatment (either the policy distance difference or the probability that the Reformist-type voters are the majority of the party A's electorate) had an impact on the choices made by the group leaders and the voters in the experiment, the sample mean values of the outcome variables have to be compared between the two levels of each independent variable. Since there are only two groups per one comparison, the two-sample *t*-test is the appropriate technique to employ. It allows for the statistical significance of the measurements in question to be verified. The evidence discussed in the previous section points to the lack of uniformity in outcomes. It is reasonable to assume variances of the two samples of an outcome mean to be unequal, which is why Welch's generalisation of the Student's *t*-test was used (Welch 1947). Table 7 presents the estimates of differences between the means of the two outcome variables across the pairs of levels of the two explanatory variables.

Table 7. Two-sample Welch's *t*-test on the difference of outcome means.

	Winning Party	Leaders' Decision
	<i>by policy distance difference</i>	
$p = 0.4$	-0.58**	0
$p = 0.6$	-0.25	-0.50**
	<i>by probability</i>	
$x - y < 0$	0	-0.33
$x - y > 0$	0.33	-0.83***
N (total = 48)	24	24

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

95% confidence interval

diff. (by policy distance difference) = $\text{mean}(x - y < 0) - \text{mean}(x - y > 0)$

diff. (by probability) = $\text{mean}(p = 0.4) - \text{mean}(p = 0.6)$

The examination of the contents of the table paints a somewhat mixed picture about the treatment effects. Policy distance difference was coded as ' $x - y < 0$ ' when equal to 0 and as ' $x - y > 0$ ' when equal to 1. First, the difference between the means of winning party, sorted by whether the policy distance difference was less than or greater than zero, is negative and statistically significant ($p < .01$). That is, the null hypothesis that the means of the two samples are equal is rejected. In the coding of the 'Winning Party' variable, 0 means 'Party A' and 1 is understood as 'Party B'. Since 'Party A' is the baseline category, this result indicates that the change from ' $x - y < 0$ ' to ' $x - y > 0$ ' under ' $p = 0.4$ '

appears to increase the propensity of voters to defect to the opposition party. The same could be stated about the change in the level of the policy distance difference variable under ' $p = 0.6$ ' if the confidence interval was narrowed to 90%: in that case, the difference between the means would have been negative and significant at $p = .082$. The 'Leaders' Decision' variable, coded as 'Black' (the status quo policy) when equal to 0 and as 'Red' (the reformed policy) when equal to 1, does not vary across the levels of the policy distance difference variable when ' $p = 0.4$ ' is administered. However, its mean value for ' $x - y < 0$ ' is 0.5 less than for ' $x - y > 0$ ' when p was set at 0.6, which is a statistically significant estimate ($p < .01$) implying that with ' $p = 0.6$ ' the intra-party bargaining leads to the adoption of a reformed policy more often when moving from negative to positive policy distance difference. All in all, when the p variable is kept at the same level, the estimates in the upper part of the table lend support to the reasoning that the theoretical model outlined for the direction of causality between the policy distance difference and the decision-making outcomes.

This conclusion can be extended to the estimates in the lower part of the table as well. Probability was coded as ' $p = 0.4$ ' when equal to 0 and as ' $p = 0.6$ ' when equal to 1. The means of the winning party sorted by the level of p are equal at ' $x - y < 0$ ' and positive (0.33) at ' $x - y > 0$ ', hinting at an increased frequency of party A winning under ' $p = 0.4$ ' than at ' $p = 0.6$ '. It must be noted that the significance of the latter would be rather weak at $p = .105$ even with a confidence interval of 90%. The negative means difference of the leaders' decision (-0.33) would have been statistically significant with a narrowed confidence interval of 90% at $p = .066$. In turn, this would inject credibility into the following statement contradicting the prediction of the Hypothesis 1: 'under the fixed ' $x - y < 0$ ' treatment the outcome of the intra-party bargaining is more likely to be a reformed official policy of the party A as p moves from 0.4 to 0.6'. The 'Leaders' Decision' means difference is negative at -0.83 and highly significant ($p < .001$) for the ' $p = 0.4$ ' to ' $p = 0.6$ ' comparison and ' $x - y > 0$ '. That is, the choice of the factions in this setting favoured a reformed policy at ' $p = 0.6$ ' a lot more often than at ' $p = 0.4$ '. To some extent, these findings can be said to match the pattern described in the Hypothesis 1: the higher level of p clearly motivates factions to opt for the policy reform and reduces the incidence of a party B victory.

Due to the weak statistical significance levels of some of the results discussed above, these conclusions have to be treated with care. The small sample size could be the main reason behind the presence of

non-significant estimates. Thus, it is important to admit the uncertainty of whether increasing the number of observations could have altered the makeup of Table 7, - and if the answer was yes, in what exact manner.

4.2.4. The order effects.

What if the treatments were only effective or absent due to the particular order, in which they were received by the participants? Table 8 contains the information resulting from the comparison of the means of the two outcome variables sorted by the treatment order (where 0 means the participants were treated with $x - y < 0$ in rounds 1-6 and 1 - in rounds 7-12) and arranged by the treatment combination. This material is sufficient to confirm or deny the interference of order effects.

Table 8. Winning party and leader's decision means difference Welch's t -test by treatment order and combination.

Probability Policy distance difference	Treatment combination			
	$p = 0.4$ $x - y < 0$	$p = 0.4$ $x - y > 0$	$p = 0.6$ $x - y < 0$	$p = 0.6$ $x - y > 0$
Winning Party	0 (n/a)	-0.17 (0.599)	0 (n/a)	0.17 (0.549)
Leaders' Decision	0.17 (0.341)	-0.17 (0.341)	0.17 (0.599)	0.17 (0.341)
N (total = 48)	12	12	12	12

p-values in parentheses

diff. (by treatment order) = mean($x - y < 0$ first) - mean($x - y < 0$ last)

The simple answer to the question posed in this section is that the mean values of the winning party and the leaders' decision variables vary between the two treatment orders (with the notable exception of the two cases where the means of the winning party variable are equal), yet these differences have no statistical significance. Since the sample contains only 48 observations, it is hard to state with absolute certainty that the difference would remain non-significant with a sufficiently increased sample size. The isolated case of the sample explored in the experiment appears to indicate that the differences in outcomes across the two orders of treatment provision are relatively small and do not interfere with the treatment effects. They might have been caused by the technical errors on part of the participants, who could have misunderstood made wrong decisions due to the influence of unobservable factors (such as the incorrect interpretation of the rules).

4.2.5. The logistic regression on leaders' decision.

In this section, I make an attempt at a more rigorous examination of the links between the explanatory variables and the leaders' decision outcome variable by employing the logistic regression (logit). This nonlinear statistical model is applied in the analysis of data on binomial outcomes and assumes a logit distribution for the outcome variable instead of a normal distribution (as is the case with the ordinary least squares model) (Long and Freese 2001, 102). The logit views the relationship of the explanatory and the outcome variables as non-linear. The leaders' decision outcome variable is dichotomous since the values it assumes are 0 and 1, which is why this model is suitable for the purposes of this investigation. Primarily, I seek to obtain the measurement of the effect that each of the explanatory variables has on the probability that leaders' decision equals to 1 (i.e., that the group leaders chose to reform the party A's policy). The formal notation of the model is

$$P(Y = 1 | X_1, X_2) = F(z),$$

where P is the probability that has to obtain, Y is leaders' decision, X_1 is policy distance difference and X_2 is the probability of a Reformist voter majority. It has a logistic distribution denoted by the function $F(z)$ of a linear function of the explanatory variables

$$z = \beta_0 + \beta_1 X_1 + \beta_2 X_2,$$

where β_0 through β_2 are the log-odds parameters indicating the effect of the explanatory variables on the probability that $Y = 1$. The values of the parameters are obtained using maximum likelihood (ML) estimation method and are not as readily interpretable, as would have been the case in a linear model with a continuous outcome. In Long and Freese's words (2001, 89), 'in nonlinear models the effect of a change in a variable depends on the values of all variables in the model and is no longer simply equal to one of the parameters of the model'. This is precisely why it would be both interesting and necessary to determine the precise amount of the impact that a discrete change of the explanatory variable from 0 to 1 has on the predicted probability of $Y = 1$. The form of the estimate in question, adopted from Long (1997, 78), is given below

$$\frac{\Delta P(Y = 1 | \bar{X}_2)}{\Delta X_1} = P(Y = 1 | \bar{X}_2, X_1 = 1) - P(Y = 1 | \bar{X}_2, X_1 = 0).$$

The term on the left-hand side of the equation is the discrete change in the predicted probability of $Y = 1$ caused by a one-unit discrete change from 0 to 1 in the value of X_1 , with the other explanatory variable, X_2 , held constant at its mean. This equation can easily be rewritten for the estimation of the

discrete change in X_2 . The estimates that were generated by means of running the model are set forth in Table 9.

Table 9. Logistic regression estimating the effects of policy distance difference and probability on leaders' decision.

	Coeff.	SE	z	Dis. Ch.	95% CI
Policy distance difference	1.89*	0.90	2.09	0.37	0.12 - 3.67
Probability	3.59***	1.00	3.58	0.64	1.63 - 5.56
<i>LR $\chi^2 = 24.52$ <i>df</i> = 2 <i>p</i> < .001</i>					

N (total = 48)

p* < 0.05, *p* < 0.01, ****p* < 0.001

The first indicator to consider is the one providing the measure of how well the model fits the data. The likelihood ratio (LR) test is used to this end (Long 1997, 96), where the null hypothesis that the effects of the policy distance difference and the probability independent variables alike (which is reflected in the coefficients) are equal to 0 is rejected with a *p*-value of less than .001. This leaves no doubt about the appropriateness of the model for the analysis of this data. Both of the ML coefficients are significant, with the effect of policy distance difference (1.89 with *z* = 2.09 at *p* < .05) on the outcome variable being clearly weaker and less statistically significant than that of probability (3.59 with *z* = 3.58 at *p* < .001). The estimates of the discrete change in the probability of the outcome variable being equal to 1 are the key to understanding the results reported in Table 9 correctly. The reformed party A's policy is 0.37 more likely to be the outcome of the intra-party process if policy distance difference is positive than when it is negative, holding the probability variable constant at its mean. This outcome is also 0.64 more likely to emerge when the probability is 0.6 than when it is 0.4, holding policy distance difference constant. In general, the Hypothesis 2.1 is reflected in the values of the discrete change, as the likelihood of the status quo policy being kept appears to be reduced by the influence of both explanatory variables: paraphrasing this, the group leaders in the experiment were indeed more likely to reform their party's policy when *R* was set to be closer to *B* than to *C*, and *p* = 0.6. Conversely, these

findings appear to speak in favour of the Hypotheses 1 and 2.2, as with $x - y < 0$ and $p = 0.4$ their prediction of the lower likelihood of the reformed party policy is met by the results.

4.3. Discussion.

It is safe to say that the findings of the laboratory experiment establish a body of evidence that is either partially or fully supportive of the theoretical insights into the outcomes of intra-party bargaining on the official party policy and the variables that determine them. Table 10 outlines the experimental evidence on whether the outcomes emerged and were determined as predicted by the theory.

Table 10. The summary of experimental evidence on the outcomes and determinants.

Outcomes	Expected determinants	Observed effects (yes/no)
SQ, Party A victory	$x < y$	<i>yes (partial)</i>
RE, Party A victory	$x > y, \frac{y}{x+y} \uparrow, q_2(1-p) \downarrow$	<i>yes</i>
SQ, uncertainty	$x > y, \frac{y}{x+y} \downarrow, q_2(1-p) \uparrow$	<i>yes</i>

Note: the upward-looking arrow indicates that the increase in the corresponding term is required; the downward-looking arrow indicates the required reduction in the corresponding term; the lack of arrow indicates that such trend is irrelevant.

The winning party element of the first outcome combination is indeed valid and is generated under the influence of the negative policy distance difference, as the descriptive and causal analyses of the previous section suggest. The detected effect of the negative policy distance treatment on the policy element of this outcome was in tune with the theory and significant, but the fact that the policy was reformed in slightly less than a half of observations for the treatment combining $p = 0.6$ and $x - y < 0$ raises an important concern as to what caused this heterogeneity to arise. The support for the second outcome is more clear-cut. Descriptively, the 0.6 (higher) chance of the Reform-type majority in the party's voter base that should improve the likelihood of the probabilistic condition being met coincides with a high rate of party A victories when the policy reform is chosen by the leaders. The analysis of treatment effects indicates that $x - y > 0$ induces the group leaders to agree on Reform more frequently. Furthermore, positive policy distance difference and 0.6 probability were found to significantly increase the incidence of the reformed party policy. There are some outlier cases where the opposition

party beats the incumbent party with a reformed policy, but these do not distort the discovered causal links significantly. The third setting manifests itself quite prominently in all analyses that were performed, as $x - y > 0$ and a lower (0.4) probability have led to a status quo policy preservation with both incumbent and opposition party victories in a sufficient number of cases.

As I mentioned earlier, some heterogeneity that was not predicted by the theory is present in the outcomes and visible in the descriptive analysis. The order effects were not discovered, but I found the variance of results across the two orders of treatment provision to be nonzero, albeit non-significant. It might have been interesting to investigate the treatment and order effects as sorted by the number of session, but the sample size would have made such analysis invalid by limiting the number of observations per treatment combination for each session available to just 3. The number of observations in the sample is a key concern, as the analysis forces me to suspect that a larger sample could have yielded estimates that are different from the ones discussed in this Chapter.

On the whole, I found substantial empirical grounds to argue that the behaviour of factions and voters of a political party leads to the electoral and policy consequences that are influenced by their knowledge of electoral uncertainty and the ideological divisions, along which the party and its electorate are split. Additional experimentation is required to examine the strategic behaviour on the individual level, even though the group-level data from the experiment indirectly suggests that the behaviour of participants generally corresponded to the Nash equilibria described in the Chapter 3.

Conclusion.

I would like to remind the reader that the inquiry that evolved into the present thesis has its roots in the casual observations about the functioning of political parties that I have been making myself for a while. The crises that sometimes shake up the very foundation of parties are doubtlessly spectacular happenings, often surrounded by controversy, public feuds between different groups of party members, chaos and the divorce with splinter groups. Some of these situations arise in dire electoral circumstances, yet in other cases fierce infighting have broken out under generally normal conditions. Such incidents strip the internal life of parties completely bare of its covers and tend to reveal the identities of the factions and their leaders as well as their stances on the policy issues of the day. Beyond the turbulence of critical moments, these divisions remain concealed from the public eye behind the closed doors of the party room. The set of conditions that keeps political parties successful and their policies stable and the dramatic failure of these that often coincides with electoral downturns is the fascinating riddle that this thesis aimed to disentangle.

The theoretical grounding. Thus, the ultimate purpose of the study was to arrive at a credible explanation of the intra-party process by considering the influential factors and the main actors that affect its structure and shape its outcomes. The overarching question that I asked in the introduction was: *‘Does a relationship exist between the intra-party policy-setting bargaining of factions and the response to such by the voters who supported the party at the previous election?’*. First of all, the scholarship in political science seems to converge on the positive answer to this question: the theories of intra-party bargaining normally tie within-party fragmentation to the electoral results. While voters are at times included in the individual behaviour-based game-theoretical models as actors in their own right, this is not the case in the studies that apply the concept of factionalism to explain the collective aspect of intra-party divisions. Therefore, as the extant research, on the one hand, acknowledges the importance of voters (Mershon and Shvetsova 2013) and, on the other hand, homogenous factions that act as a single individual with clearly defined policy preferences (Ceron 2012), I concluded that combining these two ways of thinking into the central direction of this thesis was a theoretically sound approach to adopt that also happened to make perfect intuitive sense.

The structure of intra-party bargaining with electoral response. Developing a logically consistent formal model of intra-party bargaining with voter participation that would bind together the intuitive

reasoning that stems from the casual case-based narrative and the assumptions justified with the prior scientific knowledge encompassed the next stage of this inquiry. In order to meet this challenge, I sought to obtain the explanation for the first complementary question: ‘*What is the structure and the primary mechanism of such a relationship?*’. To clarify the structural composition of the relationship, I set out to construct a one-shot sequential extensive form game of intra-party bargaining with imperfect information on the policy preference distribution in the electorate that is common to all actors. The parties were to contest elections in a perfect two-party political system. This game describes how the two equal-sized factions of a governing party with differing viewpoints on an abstract issue determine the official position of their party that is then announced to the voters, some of whom voted for the governing party in the previous election and are aligned with either of the factions on the issue. The voters, unaware of whether the policy decision was unanimous or not, have to choose whether to support the party again or vote for the opposition party instead.

The mechanism of the relationship. Consequently, the backward induction of the model paved the way for the Nash equilibria solutions to be found for the game. The three factors driving the mechanism of the relationship between the factions and the voters were revealed to be 1) the difference between the distances that separate the policy points of the Conservative faction and voters (C), the Reformist faction and voters (R) and the opposition party (B) on a one-dimensional policy scale, 2) the probability of a Reformist-minded voter type majority in the electoral base of the incumbent party and 3) the probability that the Reformist voter minority will defect to the opposition if the factions do not agree to make their preferred policy official. A list of multiple equilibria that exist under relaxed constraints is reduced to the following few strategy profiles by restricting the boundaries of probabilities and disregarding the case of equidistance between the policy points in keeping with the intuition about the real-life politics. When constrained only by the negative difference between the distances, the factions were predicted to preserve the status quo official policy for their party due to steadfast opposition of the Conservative faction to the policy reform, while the voters of both types would find it optimal (i.e. beneficial) to support the party. The factions would strictly unanimously choose to reform the party policy to win over the complete backing of their party’s voter base only under a positive difference between distances given that the policy considerations outweigh the electoral uncertainty considerations in their minds as well as in the minds of the voters. This equilibrium is fragile and may either coexist with two other equilibria under the positive distance

difference constraint or fail to satisfy at least one of the two constraints on its optimality. The remaining optimal behavioural sequences are for the factions to strictly end up securing the old policy position of the party (unanimously or not), whereby the Reformist voters would always respond with defection and the Conservative voters would remain loyal to the incumbent party. These two cases become possible when the voter and the factions see the electoral uncertainty as more important than the policy divisions. To evaluate the balance between the uncertainty and the policy, the actors have to make a detailed comparison of the two probability variables known to them and the policy distances on the scale.

The outcomes. In order to answer the second complementary subquestion of the study, '*What are the key determinants of the outcomes of this relationship and how does their influence manifest itself?*', I reformulated the Nash equilibrium strategy profiles that were derived from the model by means of conducting a backward induction on it. These were presented as the Hypotheses 1 through 2.3 in the discussion section of the Chapter 3 and tested by means of carrying out a laboratory experiment, the findings from which were examined statistically in the Chapter 4. For the purposes of the experimental evaluation of the theory, it was useful and correct to identify two separate kinds of outcomes, namely a) the policy outcome of the factionalist bargaining (the reformed or the status quo policy) and b) the winning party chosen by the electorate (the incumbent or the opposition party). The outcomes and their determinants were also divided into three groups. 1. Given the negative policy distance difference and regardless of the probabilities, the governing party was predicted to win the election on an unchanged policy with certainty. 2. Where the policy distance difference is positive, the incumbent party would certainly prevail in the election with a reformed policy with policy element worrying the factions and the voters more than the probabilities. 3. Conversely, if the uncertainty was to be seen as a greater headache for the factions and the voters alike, the policy-setting game between factions would always result in the current policy preservation with the winning party remaining unclear depending on the exact size of the dissatisfied Reformist voter minority.

The experimental findings. Crucially, the evaluation of the proposed hypotheses employed randomisation and random sampling to ensure that the unobservable personal characteristics of individual participants did not bias the procedural outcomes. The procedures were constructed so that to replicate the decision tree of the formal model in the most precise fashion. The random assignment

of participants to play the factions or the voters of either type preceded the administering of the two experimental treatments, the policy distance difference and the probability of the Reformist voter majority. Both had two levels, one of which was used as the baseline for statistical inference. The number of one-shot games was set at 12 in order to maximise the number of observations in the sample. The analysis of the data from the laboratory experiment generated a body of evidence that can be considered as largely favourable to the theoretical narrative that underpinned the experimental design. With the exception of the policy segment of the outcome combination 1 that was found to have a significant heterogeneity, the equilibrium causal relationship of the determinants and the outcomes materialised in the experimental analysis. Where the Reformist policy was situated closer to the Conservative policy than to the opposition party's policy, the incumbent party was the sole winner in all observed cases. The choice of the status quo was more likely under a positive policy distance difference and a lower level of probability and led to the victory for the opposition party more often. Alternatively, the victory of the governing party with a reformed policy was more likely under a positive distance difference and a higher probability level. However small, the presence of cases where the reformed policy was matched by the opposition party's victory is clearly abnormal. This, and the reformed policy outcome under a negative policy distance difference and a higher level of probability may be explained by the weak grasp of instructions leading to the incorrect behaviour of participants or simply by the small sample size that could have exaggerated the abnormalities of the outcomes decreased the significance of the treatment effects observed. The possibility that the order of the treatment provision distorted the outcomes was rejected with only nonsignificant descriptive evidence pointing in its direction.

The added value of the research. Now that I have completed the summary of the results, the valid question to dwell upon is the one about the added value of this study. First and foremost, by developing the theoretical model encompassing factionalism, voting behaviour and electoral uncertainty is unique and represents a step forward on the path that was defined by the previous research on intra-party bargaining. Moreover, the choice of the method of empirical evaluation that was implemented to evaluate the model is novel, as none of the earlier inquiries that aimed to come up with an evidence-based general theory of intra-party politics have done so. This thesis allows for compelling statements to be made about the intra-party bargaining. By putting the voters at the forefront, my model acknowledges the degree, to which the factional behaviour is beholden to the electoral factors. The key

insight of this study is that the factions of political parties are not only mindful of the the voters and their preferences in their reactions to a particularly defined field of preferences, but could also alter their positions to be able to exert leverage in intra-party negotiations. Being in and of itself a starting point for a larger research project, my thesis opens a window of opportunity for a new direction of inquiry into the determinants and characteristics of intra-party politics.

The limitations of the study and the future improvements. Clearly, more can be accomplished in the future by tackling a number of limitations that are inherent to a kind of initial and simplified analysis that my thesis embodies. The assumptions about the behaviour of the factions and the voters that were placed in the foundation of the model could be - and certainly need to be, - relaxed to increase the ecological validity of the theory. For instance, the model could be improved by allowing the voters to simply sit the election out. The fact that voter abstention is an immense problem in all democracies creates a major concern for the validity of my theory, and introducing this strategic option could alter the predicted behaviour of the actors profoundly. The setting of the model is an issue: as few contemporary political systems bear close resemblance to the stylised case, in which my model is framed, the institutional complexity could be increased by contrasting between various types of electoral constraints, allowing for minor parties to exist and addressing the differences in the specific packages of legislative rules in unicameral and bicameral parliaments. Furthermore, other intra-party rules could be incorporated into the extension to the model by departing from the unanimity and viewing factions as entities that are roughly equal in strength. Finally, the convenience and simplicity of the one-dimensional policy space could be replaced by a more realistic version that accounts for two policy dimensions. Even though the empirical section of this thesis delivers credible proof of the model predictions, the question marks hanging over certain portions of the experimental data speak for themselves. Any future experiment based on my model would have to take advantage of a more numerous group of participants if it is to allow for truly rigorous statistical tests to be conducted. In addition, I hope to be able to focus the next experiment not only on the group-level decision-making outcomes, but also on supporting or refuting the theoretical predictions with respect to the individual-level strategies of the voters and factions. Alternative venues of empirical evaluation could be explored, such as the observational study with a cross-country data on political parties, their factions and their electoral performance. All in all, the potential for improvement found in this thesis is great, and the list of subtopics to explore provided here is not exhaustive.

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Appendix 1. The complete list of Nash equilibria of the intra-party bargaining game with voter response with constraints.

Subgame Perfect Nash Equilibria	Constraints
(RE, RE, S, S)	$q_2(1 - p) \leq \frac{y}{x+y}, x \geq y$ or $q_2(1 - p) = 0, x \leq y$
(RE, RE, D, D)	$pq_1 = 0, q_2(1 - p) = 0, x \geq y$
(RE, SQ, S, S)	$x \leq y$
(RE, SQ, S, D)	$pq_1 = 1, x \geq y$
(RE, SQ, D, S)	$q_2(1 - p) \geq \frac{y}{x+y}, x \geq y$ or $pq_1 = 0, q_2(1 - p) = 0, x \geq y$
(RE, SQ, D, D)	$pq_1 = 0, q_2(1 - p) = 0$ or $pq_1 = 0, q_2(1 - p) = 0, x \geq y$
(SQ, S, S)	$x \leq y$
(SQ, S, D)	$pq_1 = 1, x \geq y$
(SQ, D, S)	$q_2(1 - p) \geq \frac{y}{x+y}, x \geq y$
(SQ, D, D)	$q_2(1 - p) = 0, x \leq y$

Appendix 2. Sample Black group leader instruction sheet.

(Front side)

Black group leader, Participant #_

Dear participant! Please read the following instructions carefully!

You are randomly assigned to play as the Black group leader. ***Keep in mind*** that all types of interaction with other participants are prohibited.

There are two parties, A and B. All of the participants are going to play for the party A, while the party B is hypothetical. Party A is divided into two groups, headed by Red and Black group leaders with Red and Black as their preferred points respectively. There are 4 voters of the party A randomly assigned Red or Black as their preferred point. Also, there is one hypothetical voter that will always support party B.

The game has 12 rounds, and is played as follows:

Red and Black group leaders leave the room to decide whether to keep party A's current policy, Black, or change it to Red. Black is replaced by Red only when Red group leader proposes the change and Black group leader supports it. When leaders return to the room, ***leaders' decision – the official policy point of the party A*** - is announced to the voters. Voters can then vote for party A or party B. The ***winning point*** is the point of a party that receives the majority of votes at the end of the round.

Your earnings:

The Red, Black and party B's policy points are marked on a line shown on the screen. The location of the Red point on the line will be changed in the beginning of rounds #1 and #7. If your preferred point is the winning point, your earnings are **a maximum of €10**. If a different point is chosen, your earnings are €10 minus the amount equal to absolute distance between your point and the winning point. ***At the end of the session***, two randomly selected participants receive their earnings in cash for two randomly selected rounds.

Voter players are assigned roles in the following manner:

In the beginning of each round, voters will be randomly assigned Red or Black as their preferred point by means of drawing a card of either colour from a 10-card deck. Results of each draw are not announced publicly and are known only to the participant and the assistant, to whom he/she returns the card. The number of Red cards in the deck will be announced in the beginning of rounds #1, #4, #7 and #10.

Black group leader actions:

After voters are assigned Red or Black as their preferred point, group leaders leave the room to make their decision. The Red group leader gets to move first. If their choice is Red, you can support this decision or veto it by voting for current policy. If they choose Black, it remains party A's official policy. ***Policy change happens only if both party leaders agree to it.*** You cannot offer to change policy. Please write your decision on the sheet and pass it to the assistant. Next, after both group leaders return to the room, the assistant will announce the result to the voters, who will then vote.

(Back side)

Round #	0	1	2	3	4	5	6	7	8	9	10	11	12
Number of Red cards													
Choice of the leaders (Black or Red)													
Winning point (Black, Red or party B)													
Earnings per round (€)													

Remember to enter all relevant information into a cell of an appropriate row of the table!

Don't forget to calculate your earnings per round! Your earnings per round = €10 – the distance between your preferred point and the winning point

Appendix 3. Sample Red group leader instruction sheet.

(Front side)

Red group leader, Participant #_

Dear participant! Please read the following instructions carefully!

You are randomly assigned to play as the Red group leader. **Keep in mind** that all types of interaction with other participants are prohibited.

There are two parties, A and B. All of the participants are going to play for the party A, while the party B is hypothetical. Party A is divided into two groups, headed by Red and Black group leaders with Red and Black as their preferred points respectively. There are 4 voters of the party A randomly assigned Red or Black as their preferred point. Also, there is one hypothetical voter that will always support party B.

The game has 12 rounds, and is played as follows:

Red and Black group leaders leave the room to decide whether to keep party A's current policy, Black, or change it to Red. Black is replaced by Red only when Red group leader proposes the change and Black group leader supports it. When leaders return to the room, **leaders' decision – the official policy point of the party A** - is announced to the voters. Voters can then vote for party A or party B. The **winning point** is the point of a party that receives the majority of votes at the end of the round.

Your earnings:

The Red, Black and party B's policy points are marked on a line shown on the screen. The location of the Red point on the line will be changed in the beginning of rounds #1 and #7. If your preferred point is the winning point, your earnings are a **maximum of €10**. If a different point is chosen, your earnings are €10 minus the amount equal to absolute distance between your point and the winning point. **At the end of the session**, two randomly selected participants receive their earnings in cash for two randomly selected rounds.

Voter players are assigned roles in the following manner:

In the beginning of each round, voters will be randomly assigned Red or Black as their preferred point by means of drawing a card of either colour from a 10-card deck. Results of each draw are not announced publicly and are known only to the participant and the assistant, to whom he/she returns the card. The number of Red cards in the deck will be announced in the beginning of rounds #1, #4, #7 and #10.

Red group leader actions:

After voters are assigned Red or Black as their preferred point, group leaders leave the room to make their decision. Please write "Red" to propose a policy change or "Black" to support the current policy on the sheet of paper provided to you. Then pass the paper to the assistant. If you choose to change the policy, Black group leader can support your decision or veto it by choosing Black. **Policy change happens only if both party leaders agree to it.** If you choose Black, it remains party A's official policy. Black group leader cannot offer to change policy. Next, after both group leaders return to the room, the assistant will announce the result to the voters, who will then vote.

(Back side)

Round #	0	1	2	3	4	5	6	7	8	9	10	11	12
Number of Red cards													
Choice of the leaders (Black or Red)													
Winning point (Black, Red or party B)													
Earnings per round (€)													

Remember to enter all relevant information into a cell of an appropriate row of the table!

Don't forget to calculate your earnings per round! Your earnings per round = €10 – the distance between your preferred point and the winning point

Appendix 4. Sample voter instruction sheet.

(Front side)

Voter, Participant #_

Dear participant! Please read the following instructions carefully!

You are randomly assigned to play as a voter. ***Keep in mind*** that all types of interaction with other participants are prohibited.

There are two parties, A and B. All of the participants are going to play for the party A, while the party B is hypothetical. Party A is divided into two groups, headed by Red and Black group leaders with Red and Black as their preferred points respectively. There are 4 voters of the party A randomly assigned Red or Black as their preferred point. Also, there is one hypothetical voter that will always support party B.

The game has 12 rounds, and is played as follows:

Red and Black group leaders leave the room to decide whether to keep party A's current policy, Black, or change it to Red. Black is replaced by Red only when Red group leader proposes the change and Black group leader supports it. When leaders return to the room, ***leaders' decision – the official policy point of the party A*** - is announced to the voters. Voters can then vote for party A or party B. The ***winning point*** is the point of a party that receives the majority of votes at the end of the round.

Your earnings:

The Red, Black and party B's policy points are marked on a line shown on the screen. The location of the Red point on the line will be changed in the beginning of rounds #1 and #7. If your preferred point is the winning point, your earnings are **a maximum of €10**. If a different point is chosen, your earnings are €10 minus the amount equal to absolute distance between your point and the winning point. ***At the end of the session***, two randomly selected participants receive their earnings in cash for two randomly selected rounds.

Voter players are assigned roles in the following manner:

In the beginning of each round, voters will be randomly assigned Red or Black as their preferred point by means of drawing a card of either colour from a 10-card deck. Results of each draw are not announced publicly and are known only to the participant and the assistant, to whom he/she returns the card. The number of Red cards in the deck will be announced in the beginning of rounds #1, #4, #7 and #10.

Voter actions:

You will have to return the card you have drawn to the assistant and mark its colour in the “My voter colour” row of the table for the current round. ***Once the party A policy point decided by the group leaders is announced, please write “A” or “B” on a sheet of paper provided to you to reflect your choice of the party.*** The assistant will then collect all sheets, count the votes and announce the result.

(Back side)

Round #	0	1	2	3	4	5	6	7	8	9	10	11	12
Number of Red cards													
My voter colour (Red or Black)													
Choice of the leaders (Black or Red)													
Winning point (Red, Black or party B)													
Earnings per round (€)													

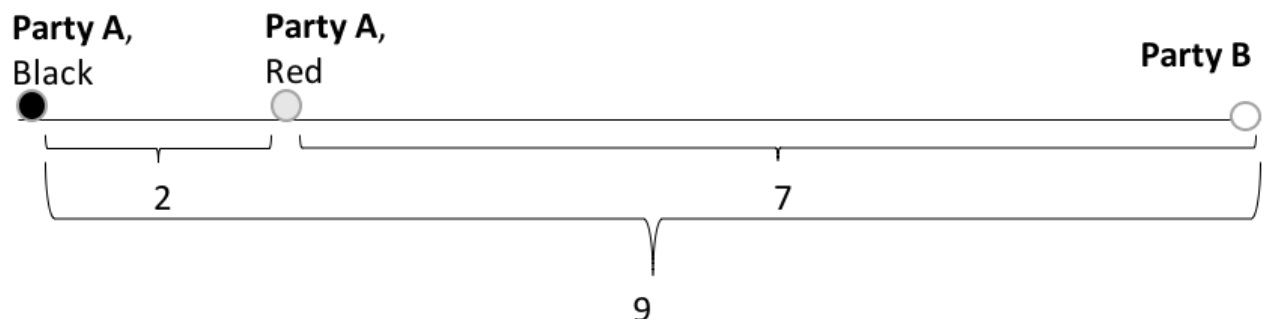
Remember to enter all relevant information into a cell of an appropriate row of the table!

Don't forget to calculate your earnings per round! Your earnings per round = €10 – the distance between your preferred point and the winning point

Appendix 5. Sample earnings practice sheet.

(Front side)

Earnings practice: The line below shows the current policy, Black; the potential new policy, Red; and the policy of the party B. The numbers are the absolute distances between the points.



Your earnings per round = €10 – the distance between your preferred point and the winning point

If the final outcome is the current (Black) policy:

What will a Red player earn? _____

What will a Black player earn? _____

If the final outcome is the new (Red) policy:

What will a Red player earn? _____

What will a Black player earn? _____

If the final outcome is Party B:

What will a Red player earn? _____

What will a Black player earn? _____

Write your answers in the spaces provided. You can find the answers on the reverse side of this sheet. Once you are ready, an assistant will come to check that your answers are correct and respond to your questions.

(Back side)

Answers.

If the final outcome is the current (Black) policy:

What will a Red player earn? $10-2=8$

What will a Black player earn? $10-0=10$

If the final outcome is the new (Red) policy:

What will a Red player earn? $10-0=10$

What will a Black player earn? $10-2=8$

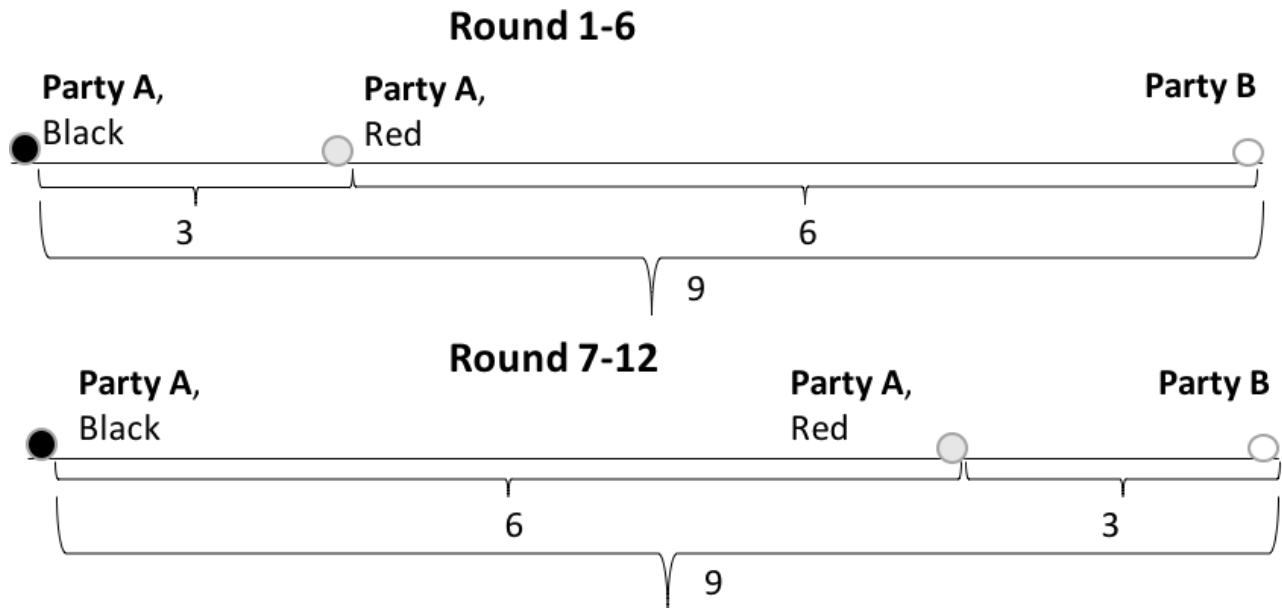
If the final outcome is the party B's policy:

What will a Red player earn? $10-7=3$

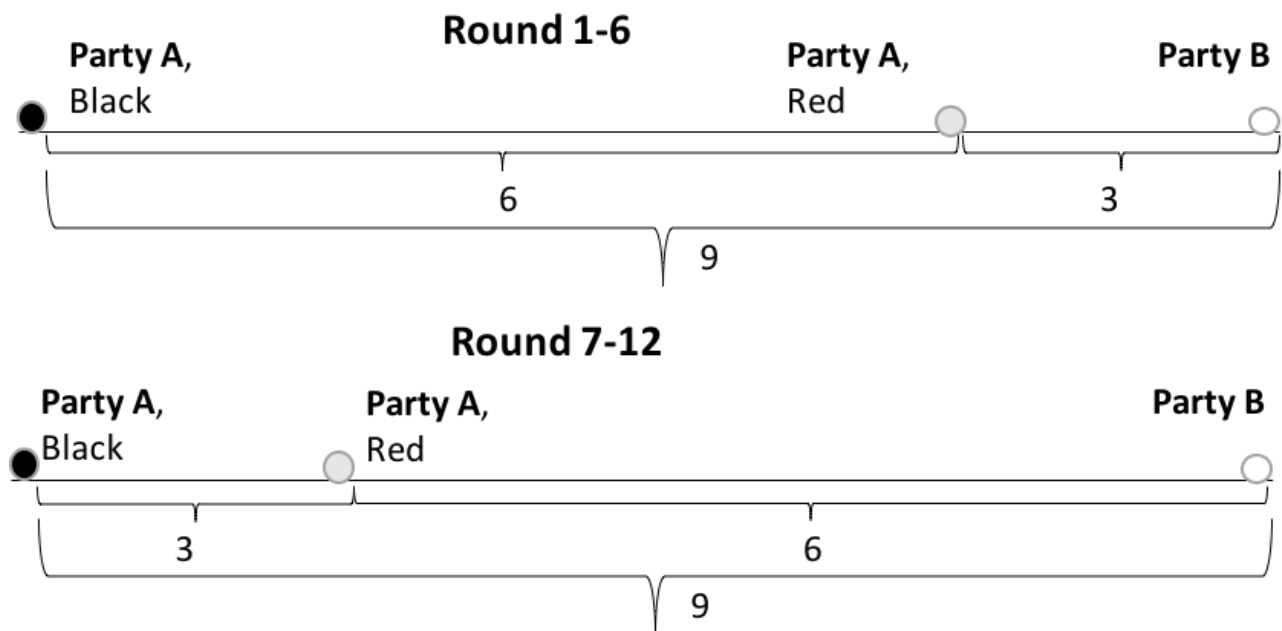
What will a Black player earn? $10-9=1$

Appendix 6. Sample policy scale sheets.

(Treatment provision order 1: negative policy distance difference first)



(Treatment provision order 2: negative policy distance difference last)



Appendix 7. Sample group leader and voter ballot sheets.

(Red group leader sheet)

Propose policy	
Red	Black

(Black group leader sheet)

Respond	
Red	Black

(voter ballot sheet)

Party	
A	B

ID:.....

Consent Form

Experiment Purpose & Procedure

The purpose of this experiment is to examine within-group decision making and voter response to its outcomes.

The experiment consists of one 12-round session, during which you will be asked to play *a game modelling the above-described relationship*. At the end, you will be paid small monetary rewards.

Please note that none of the tasks is a test of your personal intelligence or ability. The objective is to test the hypotheses of the study.

Confidentiality

The following data will be recorded: card draw results, player choices and individual earnings per round.

All data will be coded so that **your anonymity will be protected** in any research papers and presentations that result from this work.

Finding out about result

If interested, you can find out the result of the study by contacting the researcher Arseniy Lobanovskiy at lobanovskiy.arseniy.x@student.uta.fi, or on 29.03 at the GSF Thesis Seminar.

Record of Consent

Your signature below indicates that you have understood the information about the current experiment and consent to your participation. The participation is voluntary and you may refuse to answer certain questions on the questionnaire and withdraw from the study at any time with no penalty. This does not

waive your legal rights. If you have further questions related to this research, please contact the researcher.

Participant

Date

Researcher

Date

Appendix 9. The experimental data codebook.

Codebook.

SESSION – a numerical variable indicating the number of the session according to the temporal order, in which sessions were held (session 1 – 13.03.2017; session 2, 3 – 15.03.2017; session 4 – 17.03.2017).

ROUND – a numerical variable that indicates the number of the round (1-12)

ID – a string variable storing identification numbers of participants. Roman numerals I, II, III (and IV) stand for the number of the session, in which the participant took part; Arabic numerals stand for the number that the participant had during the session.

COLOUR – a categorical variable indicating the colour of the card drawn by the participant (only voter participants, per round). 0 is 'Black', 1 is 'Red'

LEADER – a binary variable indicating whether the participant is a group leader. 0 is 'No', 1 is 'Yes'

XYDIFF – a binary variable indicating the difference between x and y . 0 is ' $x - y < 0$ ', 1 is ' $x - y > 0$ '.

P – a binary variable indicating the probability that voter participants will have 'Red' as their preferred colour (the number of Red cards in the 10-card deck, changes after round 0 and then after every 3 rounds). 0 is '0.4', 1 is '0.6'

LEADERDECISION – a binary variable indicating the official policy point of the party A as decided by the group leaders for each round. 0 is 'Black', 1 is 'Red'.

WINNINGPARTY – a binary variable indicating the party that won the round. 0 is 'party A', 1 is 'party B'.

TREATMENT – a categorical variable indicating the treatment combination. 1 is ' $p = 0.4, x - y < 0$ ', 2 is ' $p = 0.4, x - y > 0$ ', 3 is ' $p = 0.6, x - y < 0$ ', 4 is ' $p = 0.6, x - y > 0$ '.

TORDER – a binary variable indicating the order of treatment provision. 0 is ' $x - y < 0$ first', 1 is ' $x - y < 0$ last'.

RED - a continuous numerical variable indicating the probability that voter participants who drew a Red card will vote for the party B if the group leaders' decision is not 'Red' (based on the number of voter participants who picked a Red card for the round).

EARNINGS – a numerical variable indicating the amount earned by a participant per round (€).